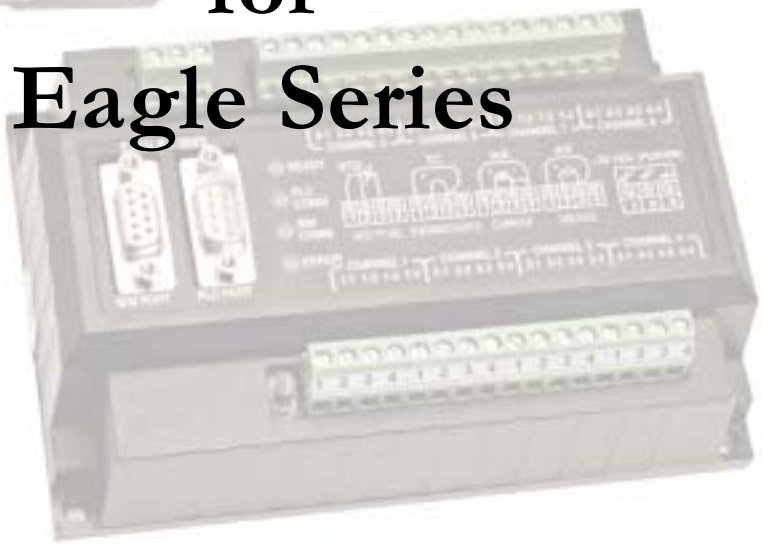
User's Manual for Eagle Series



COPYRIGHT NOTICE

This manual is a publication of Renu Electronics Pvt. Ltd. and is provided for use by its customers only.
The contents of the manual are copyrighted by Renu Electronics; reproduction in whole or in part, for use other than in support of Renu Electronics equipment, is prohibited without the specific written permission of Renu Electronics.

SERVICE

If service is required then pack the unit in its original packaging container or, if unavailable, any suitable rigid container. If a substitute container is used, surround the unit with shock absorbing material; damage in shipment is not covered by the warranty. Include a letter with the unit describing the difficulty and Hardware Revision and Software Version. Send to the following address:

Renu Electronics Pvt. Ltd.
Survey No. 2/6,
Baner Road,
Pune-411045

All returns will be tested to verify customer claims of noncompliance with the product warranty. Improper return packaging, which makes verification impossible, will void the warranty. If noncompliance is verified and is not due to customer abuse or the other exceptions described with product warranty, Renu Electronics will, at its option, repair or replace the Product returned to it, freight prepaid, which fail to comply with the foregoing warranty, provided REPL is notified of such noncompliance within the one-year warranty period.

ASSISTANCE

This manual is designed to provide the necessary information for trouble-free installation and operation of your Eagle Series. However, if you need assistance, please call Renu Electronics Pvt. Ltd. at 91-20-27292840 or visit our web site at www.renuelectronics.com

MANUAL REVISION

If you contact us in reference to this manual, please include the following document number

Name	:	User Manual Eagle Series
Part Number	:	URML450
Document	:	UMAN\EGL\0507
Revision	:	1.00

Revision Number	Document Number	Date	Description
Rev 1.00	UMAN\EGL\0507	29-05-2007	Cable diagrams are added.

Warranty Certificate

For New product: This product is warranted against defects in materials and workmanship for a period of 12 months from the date of shipment to Buyer.

For Rectified Products: Any product that will be replaced will have Warranty for 6 months or upto Original Product Warranty period whichever is greater.

The warranty is limited to repair or replacement of the defective unit at the option of the manufacturer. This warranty is void if the product has been altered, misused, dismantled, or otherwise abused.

ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, ARE EXCLUDED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

MAINTENANCE & SERVICE : There are no parts that can be serviced by the user. Service should be performed on a unit substitution basis only. Do not attempt to remove, replace or service any printed circuit board, components or any hardware/software related with display product. If problem within the display product occurs, contact the factory for service information or repair.

NOTE : Renu Electronics Pvt. Ltd. is dedicated to providing complete customer service and customer satisfaction. If you have any comments or criticisms about how to improve the product features/reliability, please make a note of the problem/improvement and notify us. We are always open to new ideas and improvements. So please let us know your ideas and comments.

IMPORTANT

Eagle Series Products are intended to be operator interfaces, to work with PLCs which actually take control actions. It is assumed that the user is well acquainted with the PLC system being used. Never use Eagle units to perform emergency STOP applications. It is advised that separate switches be used outside the PLC for ANY emergency Stops.

Any Mechanical or Electrical Modification to this Unit will void all Warranties.

Contents

Introduction **1**
1.1 Purpose of this Manual 2
1.2 Introduction to Eagle 2
1.3 Eagle Configuration 2
1.4 Eagle Applications 3
1.5 Eagle Specifications 4
1.6 General Specifications 4
Hardware **5**
2.1 Dimensional Details 6
2.2 Power Requirements 7
Getting Started **8**
3.1 Eagle Operation - Configuration and Communication 9
How to Order **16**
4.0 How to Order 17
4.1 PLC's Supported and suitable cables 17
Installation and Wiring **18**
5.0 Hardware Installation 19
5.1 Communication Port Details 22
Modbus Configuration **23**
6.0 Modbus RTU Slave Eagle 24
CABLE DIAGRAMS **26**
7.0 IBM Cable Diagrams 27
7.1 PC to Eagle PLC Port Cable Diagrams 28
7.2 Prizm to Eagle IBM Port Cable Diagrams 30
7.3 Prizm to Eagle PLC Port Cable Diagrams 31
7.4 Non-Modbus Communication Cable Diagrams 37
7.4.1 MICROLOGIX PLC (MINIDIN) to Eagle 0404 / 0800 (SC-E-027A-00): 37
7.4.2 ALLEN BRADELY DH485 to Eagle 0404 / 0800 (SC-E-007-00): 38
7.4.3 AROMAT FP0/FPM to Eagle 0404 / 0800 (SC-E-015A-00): 39
7.4.4 AROMAT FP1 to Eagle 0404 / 0800 (SC-E-015B-00): 40
7.4.5 DELTA DVP PLC to Eagle 0404 / 0800 (SC-E-044-00): 41
7.4.6 FUJI FLEX to Eagle 0404 / 0800 (SC-E-028-00): 42
7.4.7 GE 90 SERIES PLC to Eagle 0404 / 0800 (SC-E-002-00): 43
7.4.8 GE VERSAMAX PLC to Eagle 0404 / 0800 (SC-E-002A-00): 44
7.4.9 GE VERSAMAX PLC to Eagle 0404 / 0800 (SC-E-002B-00): 45
7.4.10 IDEC MICRO3 PLC to Eagle 0404 / 0800 (SC-E-025A-00): 46
7.4.11 IDEC MICROSMART PLC to Eagle 0404 / 0800 (SC-E-025B-00): 47
7.4.12 KEYENCE KV PLC to Eagle 0404 / 0800 (SC-E-018-00): 48
7.4.13 LG MASTER-K SERIES PLC to Eagle 0404 / 0800 (SC-E-037-00): 49
7.4.14 MITSUBISHI FX0 PLC to Eagle 0404 / 0800 (SC-E-008A-00): 50
7.4.15 OMRON CQM1 PLC to Eagle 0404 / 0800 (SC-E-006B-00): 51
7.4.16 OMRON HOSTLINK to Eagle 0404 / 0800 (SC-E-006C-00): 52
7.4.17 SIEMENS STEP-7 MICRO (S7-200) PLC to Eagle 0404 / 0800 (SC-E-029-00): 53

7.4.18 TELEMECHANIQUE TSX-07/TSX-37 PLC to Eagle 0404 / 0800 (SC-E-026A-00): 54
7.4.19 TOSHIBA T1 PLC to Eagle 0404 / 0800 (SC-E-019A-00): 55
7.4.20 TOSHIBA T2 PLC to Eagle 0404 / 0800 (SC-E-019B-00): 56
FAQs **57**
8.0 Frequently asked questions for Eagle 58
Troubleshooting **61**
9.0 Troubleshooting Guide for Eagle 62

Introduction

In this chapter. . .

- Purpose of this Manual
- Introduction to Eagle
- Eagle Configuration
- Eagle Applications
- Eagle Specifications

1.1 Purpose of this Manual

The intention of this Operation Manual is to provide a guide for Safe installation, Configuration and Operation of Eagle. This manual is applicable for general purpose Eagle (Part Eagle-XXXX) units. **Functionality of all the Eagle models is same.**

Read this operation manual thoroughly before installing and operating Eagle.

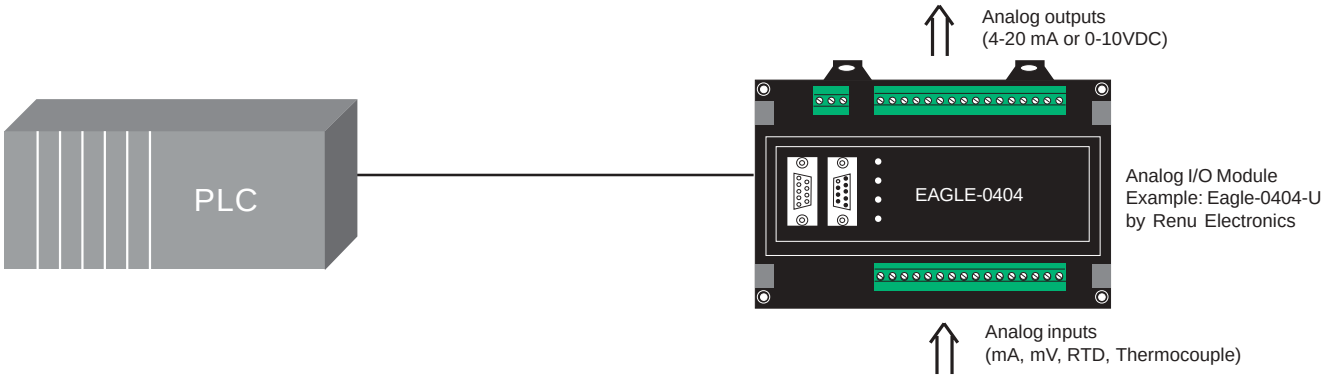
This document is based on information available at the time of its publication. While efforts have been made to be accurate, the information in this document may not cover all the details or variations in hardware or software. Features described herein may not be present in all hardwares. Renu Electronics reserves the right to update information in this publication without prior notice.

1.2 Introduction to Eagle

Eagle is an Industrial Analog I / O series. It accepts Universal Analog Inputs (e.g. Thermocouples, RTDs, mA, mV) and provides Analog Outputs (4 to 20 mA or 0 to 10 V DC). Eagle can be connected to the programming port of PLC and SCADA Applications.

1.3 Eagle Configuration

Each Eagle has to be configured using Windows based configuration Software before connecting it to the PLC.

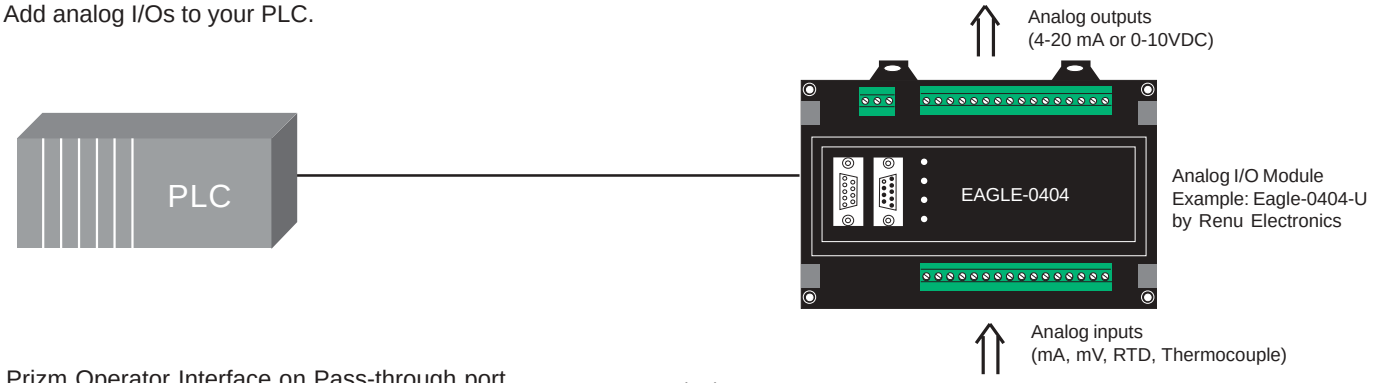


Multiple Eagle units (Modbus Slaves) connected to one PLC

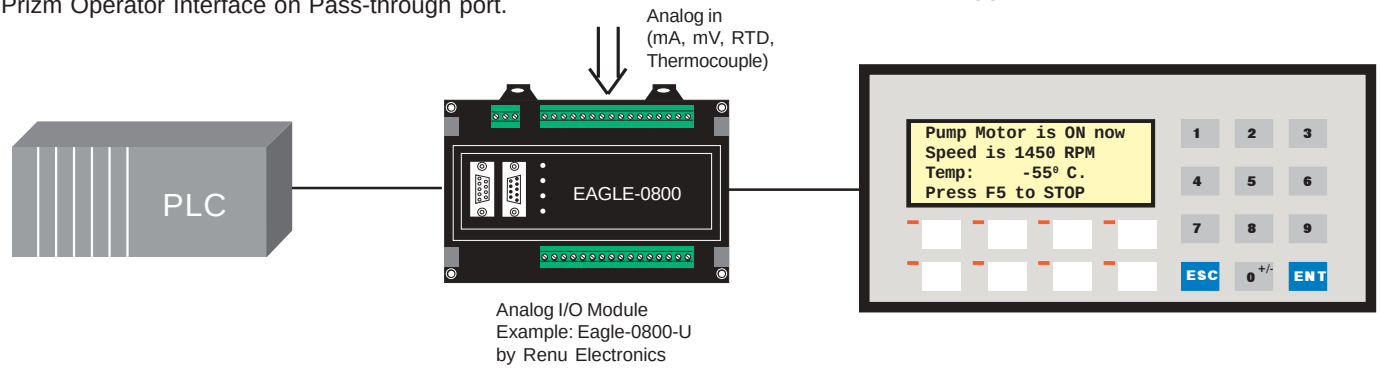
1.4 Eagle Applications

Our users have used Eagle units in various different applications across many industries. The typical configurations include the followings:

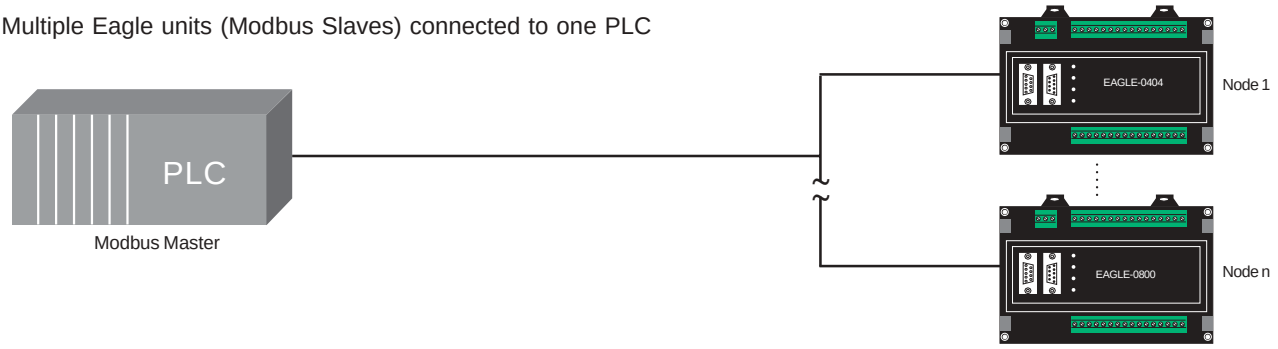
1. Add analog I/Os to your PLC.



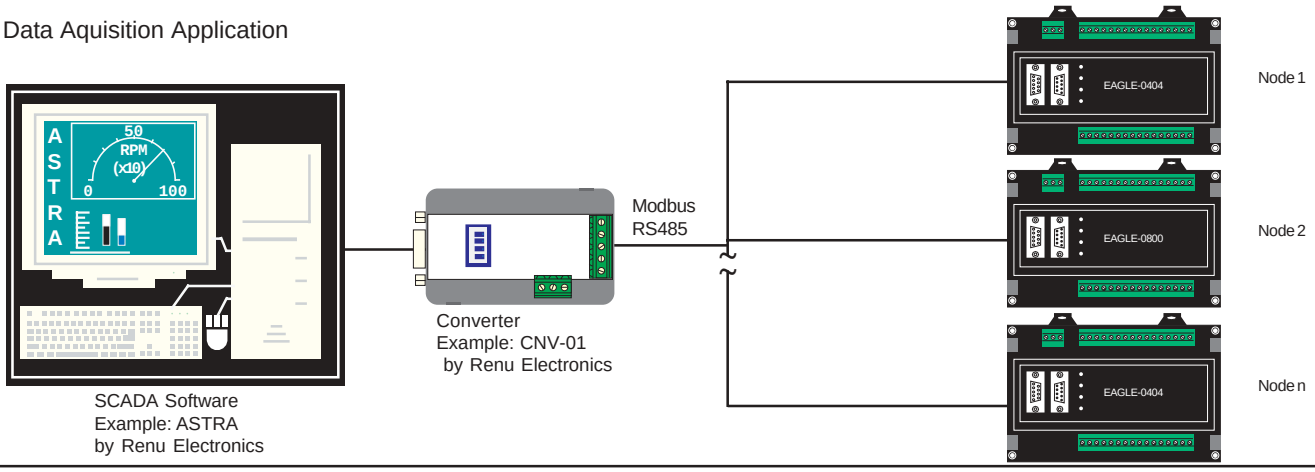
2. Prizm Operator Interface on Pass-through port.



3. Multiple Eagle units (Modbus Slaves) connected to one PLC



4. Data Aquisition Application



1.5 Eagle Specifications

For Voltage inputs:
Uses 0-100 mV input range resolved in 12 bit.
For higher input ranges, use externally calibrated shunt.
Total error: ± 0.1% of scale ± 1 bit.

For Current inputs:
Uses 0-20mA input range with 5Ω precision shunt resolved in 12 bit. Total error: ± 0.1% of scale ± 1 bit.

For RTD input:
Uses 3 wire compensation technique. Current sense is 0.5mA.
Power dissipated in RTD is 0.025mV @ 100Ω.
Range supported: -200 to 850°C.

For Thermocouple Input:
Uses 0-100mV input range resolved in to 12 bits for positive input and resolved in 11 bits for negative inputs.
Cold junction error is 1° maximum and 0.5° typical.
Total error: ± 0.5% of scale ± 1 bit + CJC error

Input Type	Temperature Range	1 Bit Corresponds to
J	-210 to 770ºC	0.43ºC
K	-200 to 1373ºC	0.61ºC
E	-200 to 1000ºC	0.32ºC
R	-50 to 1769ºC	2.04ºC
S	-50 to 1769ºC	2.31ºC
B	0 to 1820ºC	3.21ºC
N	-200 to 1300ºC	0.7ºC
T	-200 to 400ºC	0.47ºC

For outputs:
(Supported outputs are mA and Volts)
mA range: 4-20mA resolved in 12 bits.
Max load impedence: upto 500 Ω
Voltage Range:0-10VDC resolved in 12 bits
Min load impedence: 400 Ω

1.6 General Specifications

Power	: +24 V DC ±5%, 3.5 W maximum
Operating Temperature	: 0° to 50°C
Storage Temperature	: -20° to 80°C
Humidity	: 10% to 90% (Non condensing)
Mounting	: DIN rail or back panel mounting
Dimensions	:
Eagle-0404, Eagle-0800	: 155mm X 102mm X 48mm
Eagle-0201	: 94mm X 42mm X 47mm
Immunity to ESD	: 8 kV air, 6kV contact as per IEC 61000-4-2
Transient Immunity	: 2kV as per IEC 61000-4-4
Radiated Immunity	: 10V/meter as per IEC 61000-4-3
Emissions	: EN55011 CISPR A
Isolation	: Analog section from digital.
	: No isolation between channels.
IBM Port	: Connects to PC for application download or operator interface for Pass-through.
PLC Port	: Connects to PLC.
Response time	: Depends on driver. Typical 100 mSec / Channel

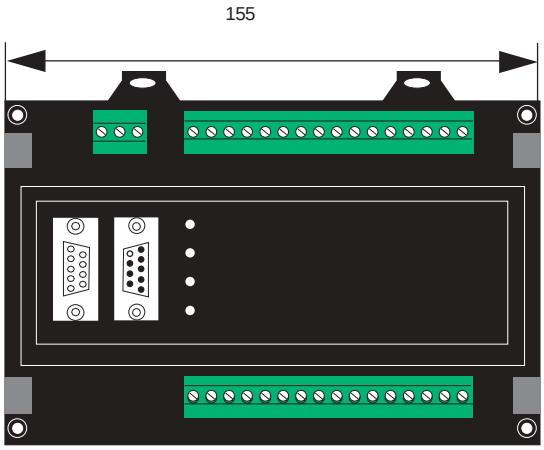
Hardware

In this chapter. . .

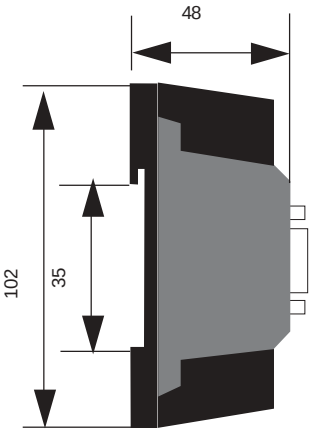
- Dimensional Details
- Power Requirements

2.1 Dimensional Details

All dimensions are in mm.
For Eagle-0800 and Eagle-0404

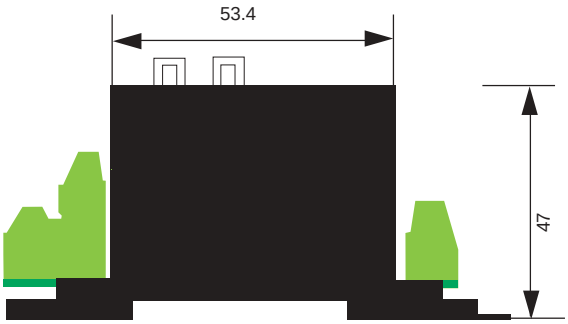


Top View

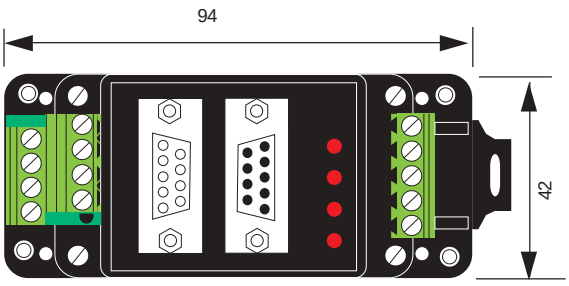


Side View

Eagle-0201



Front View



Top View

2.2 Power Requirements

Eagle units operate on 24V DC external supply. Power should be applied to the PCB Terminal block on the Eagle unit. Power rating is +24VDC ± 5%, 125mA max. Please follow the instructions given below while making power supply connections:

Follow the sticker wiring diagram on the unit which shows terminals for the positive DC, negative DC and EARTH.

To make a connection strip about 1/4" (6mm) of insulation of the wire and turn the connector screw counter-clock wise until the gap is wide open. Insert the wire all the way in and turn the screw clockwise until it is tight.

Wire lengths should be minimum. Wires should run in pairs with a neutral or common paired with a live or signal wire.

Eagle products are housed in a molded ABS plastic case which eliminates any electrical shock hazard. Hence safety ground is not required to be connected to the chassis of the unit.

The DC ground is not directly coupled to Earth ground internally. The unit is designed to operate properly whether the DC ground is connected to the Earth ground or not. We do recommend, however, that if the DC ground has to be connected to the Earth ground, the Earth connection should be made to a central star point as poor site earths can introduce noise into a system.

Do not power Eagle and inductive loads with the same power supply even though there is enough immunity in the Eagle to withstand the transients present on these lines. Avoid using power supplies with large capacitive outputs, which may cause problems if power is cycled within a short time period. If wiring is to be exposed to lightening or surges, use appropriate surge suppression devices.

Keep AC, high energy and rapidly switching DC wiring separate from signal wires.

Connecting high voltages or AC power mains to the DC input will make Eagle unusable and may create an electrical shock hazard to personnel. Such a failure or shock could result in serious personal injury, loss of life and/or equipment damage. DC voltage sources should provide proper isolation from main AC power and similar hazards.

Getting Started

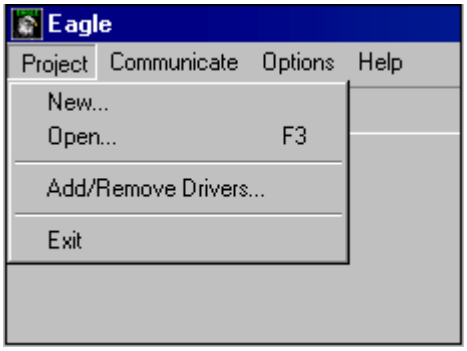
In this chapter. . .

- Eagle Operation - Configuration and Communication

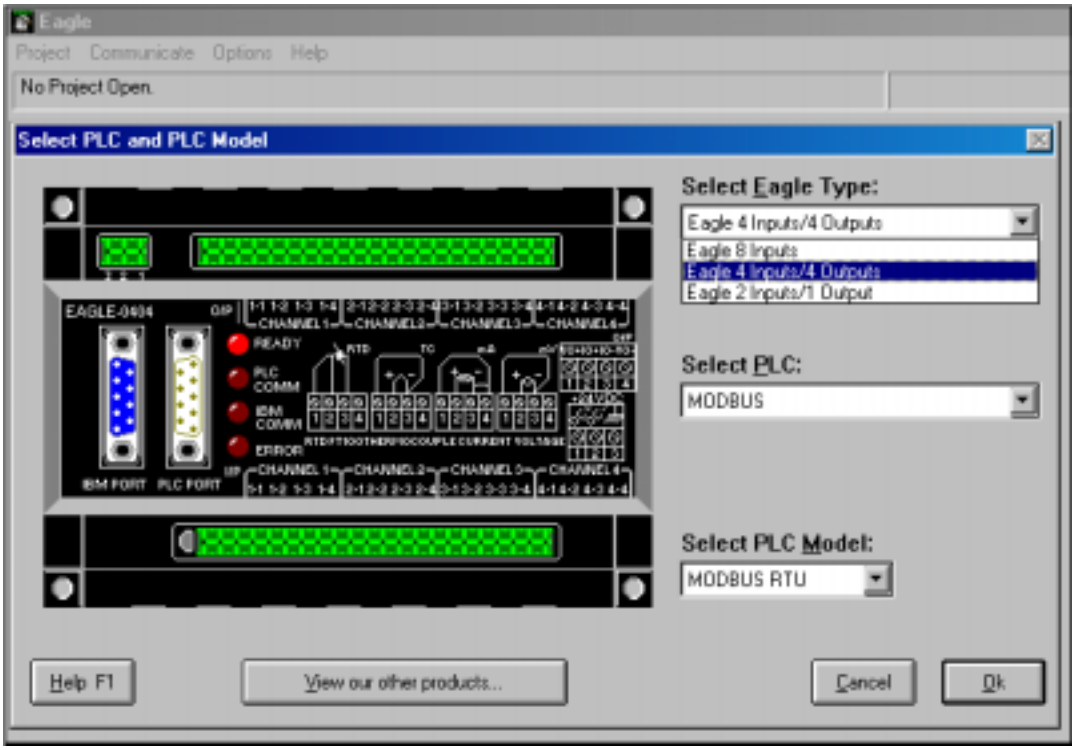
3.1 Eagle Operation - Configuration and Communication

Install the Eagle Setup Software from the installable device (CD).
It will add the icon in your program manager as Eagle.
Quick start for setup for Eagle & input parameters alongwith downloading ranges, LED indications & status word meanings are as mentioned below:

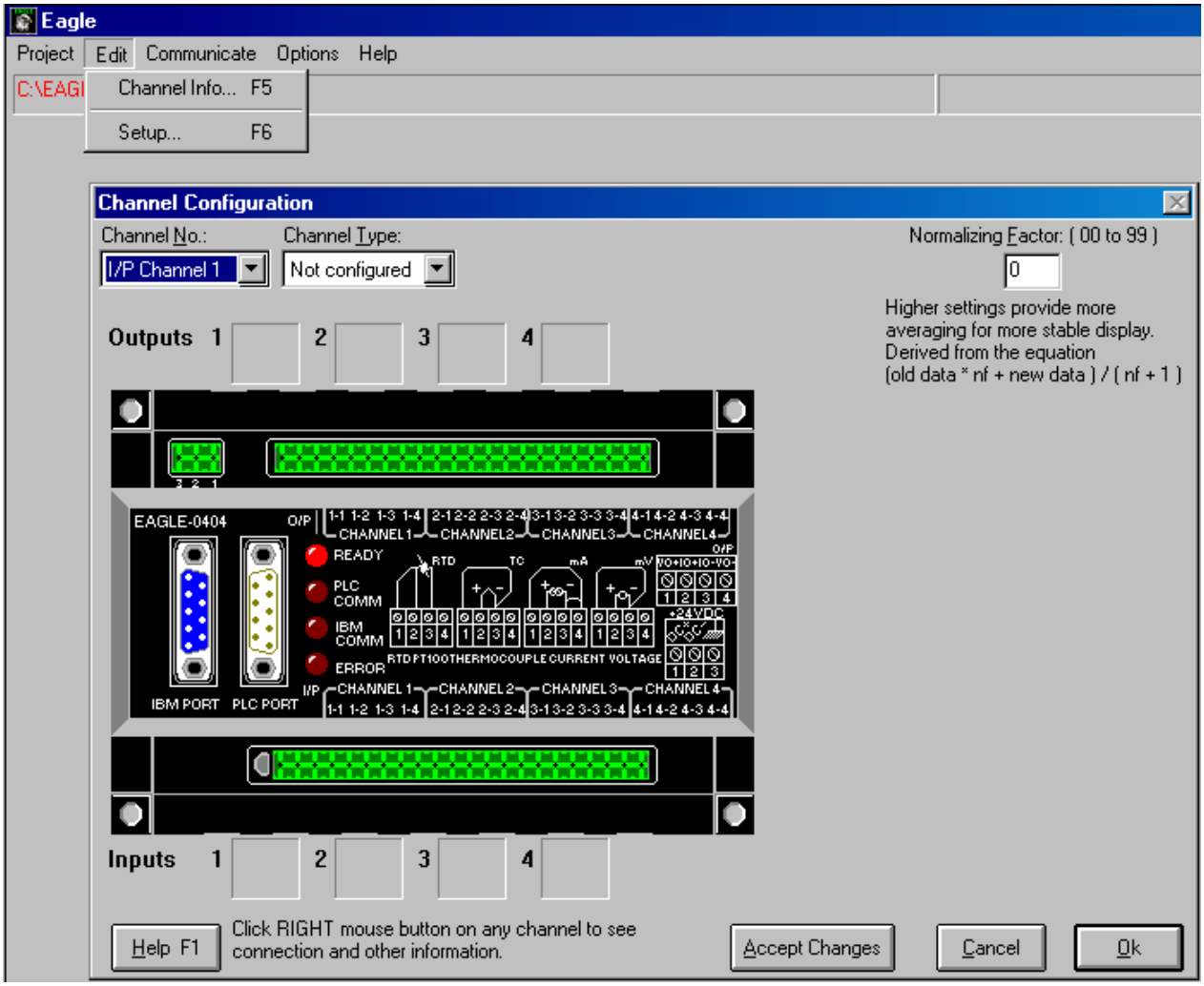
Select *Project* | *New*... from the Eagle Setup Software



Select the Eagle Model:
EAGLE-0800: 8 Universal Inputs ,no Outputs.
EAGLE-0404: 4 Universal Inputs, 4 Analog Outputs.
EAGLE-0201: 2 Universal Inputs, 1 Analog Output.
Select the *PLC and PLC Model*: Select the PLC Model for which Eagle Unit is to be connected.



Select *Edit* | *Channel* Info... to configure the channels.



EAGLE-0800:

In case of 8 analog inputs:

Select the Channel No. (1 to 8) from the Channel number list.

Select the Channel Type from the Type list:

Default for the channel is Not configured.
Input types and sub-types supported are:

Thermocouples:

Thermocouple B type,
Thermocouple R type,
Thermocouple S type,
Thermocouple E type,
Thermocouple J type,
Thermocouple K type,
Thermocouple N type,
Thermocouple T type.

* Eagle will download degree centigrade multiplied by 10 according to NBS polynomials for thermocouples in the PLC / Host device.

RTD:PT-100 (3 wires supported):

Temperature Coefficient 1 (0.00385),
Temperature Coefficient 2 (0.00392).

* Eagle will download degree centigrade multiplied by 10 according to NBS polynomials for RTD in the PLC / Host device.

mA (milli Ampere):

0 - 20 mA (Linear and 16 point Non-Linear),
4 - 20 mA (Linear and 16 point Non-Linear).

* Internal shunt of 5 ohm is assembled.
* Eagle will download the 12 bit count in case of linear input & engineering value in case of nonlinear input.

mV (milli Volts):

0 - 100 mV (Linear and 16 point Non-Linear),
0- 50 mV (Linear and 16 point Non-Linear).

* Eagle will download the 12 bit count in case of linear input & engineering value in case of nonlinear input.

When you select, Non-linear, you must enter atleast 3 sets of input (Minimum, intermediate and maximum) and engineering values. The input range is dependant on the mA or mV type and the engineering value is from -3276.0 to 3276.0.

Once you have configured the channels, Press Accept Changes button.

EAGLE-0404:

In case of 4 analog inputs, 4 analog outputs:
Select the Channel No. (1 to 4 i/p or 1 to 4 o/p) from Channel number list.

Select the Channel Type from the Type list:

Default for the channel is Not configured.
Input types and sub-types supported are:

Thermocouples:

Thermocouple B type,
Thermocouple R type,
Thermocouple S type,
Thermocouple E type,
Thermocouple J type,
Thermocouple K type,
Thermocouple N type,
Thermocouple T type.

* Eagle will download degree centigrade multiplied by 10 according to NBS polynomials for thermocouples in the PLC / Host device.

RTD:PT-100 (3 wires supported):

Temperature Coefficient 1 (0.00385),
Temperature Coefficient 2 (0.00392).

* Eagle will download degree centigrade multiplied by 10 according to NBS polynomials for RTD in the PLC / Host device.

mA (milli Ampere):

0 - 20 mA (Linear and 16 point Non-Linear),
4 - 20 mA (Linear and 16 point Non-Linear).

* Internal shunt of 5 ohm is assembled.
* Eagle will download the 12 bit count in case of linear input & engineering value in case of nonlinear input.

mV (milli Volts):

0 - 100 mV (Linear and 16 point Non-Linear),
0- 50 mV (Linear and 16 point Non-Linear).

* Eagle will download the 12 bit count in case of linear input & engineering value in case of nonlinear input.

When you select, Non-linear, you must enter atleast 3 sets of input (Minimum, intermediate and maximum) and engineering values. The input range is dependant on the mA or mV type and the engineering value is from -3276.0 to 3276.0.

Outputs:

4 - 20 mA: Sourcing current output @ 500 ohm max. load impedance
0 to 10 V DC (Linear output): Minimum load impedance 400 ohm.

Once you have configured the channels, Press Accept Changes button.

EAGLE-0201#:

In case of 2 analog Inputs, 1 analog Output:
Select the Channel No. (1 to 2 Input or Single Output) from Channel number list.

Select the Channel Type from the Type list:

Default for the channel is Not configured.
Inputs types and sub-types supported:

Thermocouples:

Thermocouple B type,
Thermocouple R type,
Thermocouple S type,
Thermocouple E type,
Thermocouple J type,
Thermocouple K type,
Thermocouple N type,
Thermocouple T type.

* Eagle will download degree centigrade multiplied by 10 according to NBS polynomials for thermocouples in the PLC / Host device.

RTD:PT-100 (3 wires supported):

Temperature Coefficient 1 (0.00385),
Temperature Coefficient 2 (0.00392).

* Eagle will download degree centigrade multiplied by 10 according to NBS polynomials for RTD in the PLC / Host device.

mA (milli Ampere):

0 - 20 mA (Linear and 16 point Non-Linear),
4 - 20 mA (Linear and 16 point Non-Linear).

* Internal shunt of 5 ohm is assembled.
* Eagle will download the 12 bit count in case of linear input & engineering value in case of nonlinear input.

mV (milli Volts):

0 - 100 mV (Linear and 16 point Non-Linear),
0- 50 mV (Linear and 16 point Non-Linear).

* Eagle will download the 12 bit count in case of linear input & engineering value in case of nonlinear input.

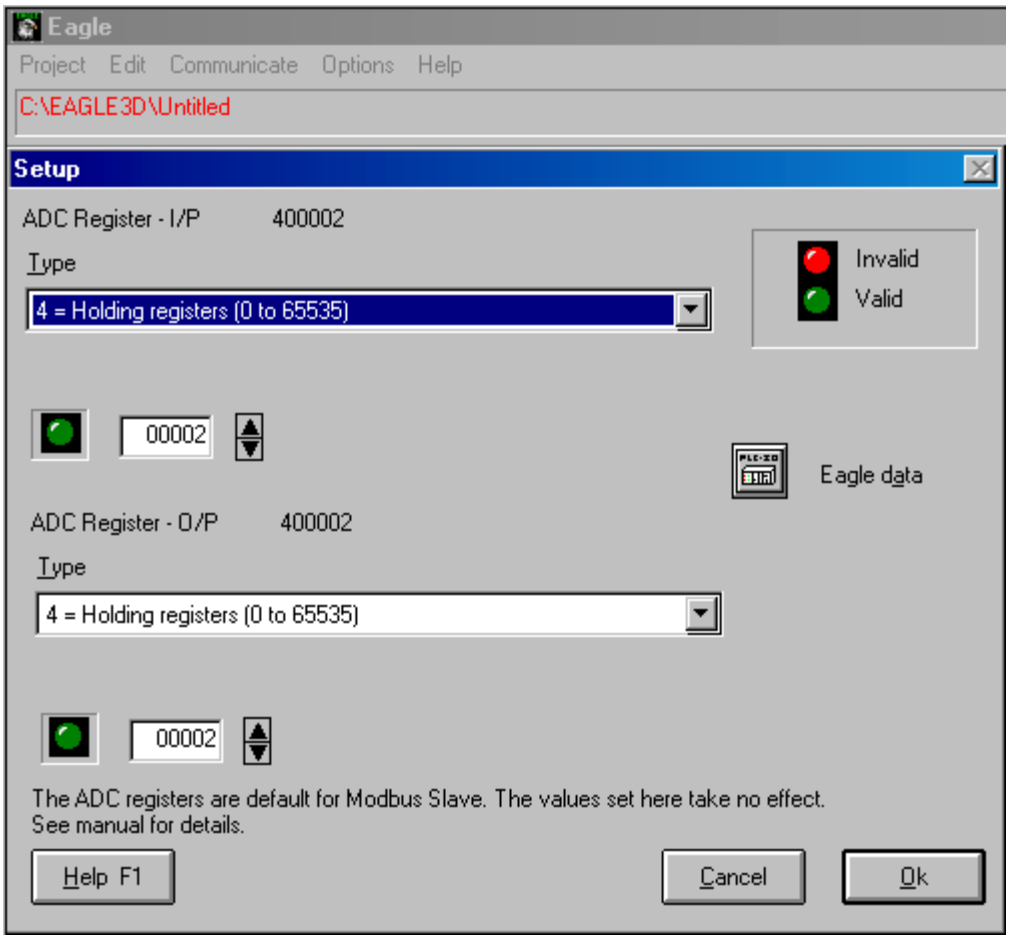
When you select, Non-linear, you must enter atleast 3 sets of input (Minimum, intermediate and maximum) and engineering values. The input range is dependant on the mA or mV type and the engineering value is from -3276.0 to 3276.0.

Outputs:

4 - 20 mA: Sourcing current output @ 500 ohm max. load impedance

Once you have configured the channels, Press Accept Changes button.

Select Edit Setup for configuration of PLC registers.

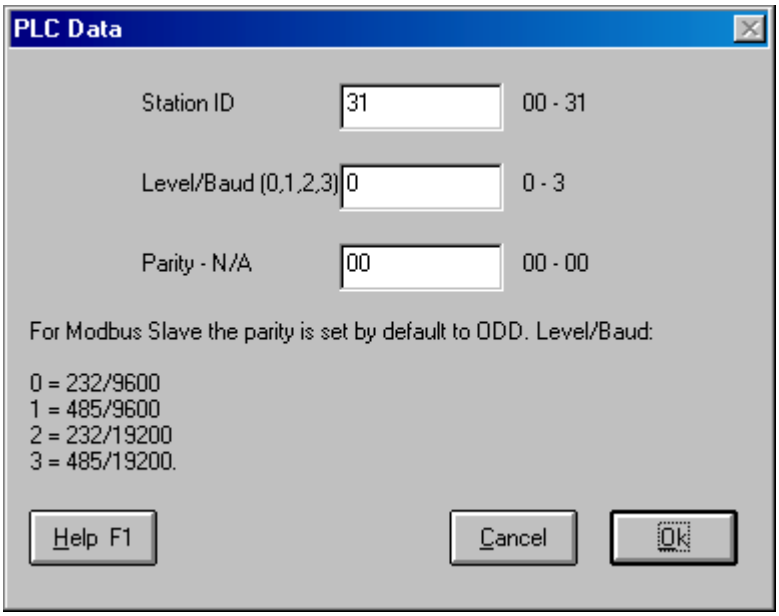


ADC Register- I/P:
This is the register where the information for the first input channel will be stored in the PLC. The following seven registers will have the data for the other seven channels.

ADC Register- O/P:
For Eagle 0404 and Eagle 0201, this is the register where the information for the first O/P channel will be stored in the PLC. The following three registers will have the data for the other three O/P channels.

Note:
For Modbus RTU Slave and RENU Special Eagle Driver; the ADC register input and ADC register output fields are don't care.

Eagle Data:
After Clicking this button you will see the following window. This is applicable for certain PLC's only. (e.g. MODBUS RTU)



Station ID: In case of multiple units connected on the same network, this field defines unit address for the specific unit.

Level/Baud: There are four combinations for this field according to communication protocol (RS232 / RS485) and communication baud rate.

Select Project | Save... to save the project.

After making project file on setup, connect 24V DC@ 3 W regulated power supply to unit connect IBM Cable on the IBM port of Eagle and the PLC cable on PLC port of Eagle.

Select Communicate | Downloaded to Unit and the saved project will be downloaded in to the Eagle.

Eagle will start communicating with the PLC.

How to Order

In this chapter. . .

- How to Order
- PLC's Supported by Eagle

4.0 How to Order

Model	Analog Inputs	Analog Outputs	Digital Input	Digital Output	Part Number	Listing
Eagle 0201#	2 Universal	1(4-20 mA)	3	2	Eagle-0201-0302-U	CE/CSA
Eagle 0404	4 Universal	4 (4-20 mA / 0-10 V DC)	0	0	Eagle-0404-U	CE/CSA
Eagle 0800	8 Universal	0	0	0	Eagle-0800-U	CE/CSA

More models are being added. We also make custom models . #Supports only Modbus RTU (Needs Eagle software ver. Eagle0201_SP)

4.1 PLC's Supported and suitable cables

PLC	COM Port	Cable part number (Eagle0404, Eagle0800)	Pass-through Support
AB Micrologix	RS232	SC-E-027A-00	✓
AB SLC 500 (DF1 and DH485)	RS422	SC-E-007-00	Network
Aromat FP0 Series	RS232	SC-E-015A-00	✓
Aromat FP1	RS485	SC-E-015B-00	✓
Delta DVP Series	RS232	SC-E-044-00	✓
Fuji NB0	RS485	SC-E-028-00	X
GE Series 90-30 (SNP)	RS485	SC-E-002-00	✓
GE VersaMax, RJ45	RS232	SC-E-002A-00	✓
GE VersaMax, DB9	RS232	SC-E-002B-00	✓
IDEC Micro3	RS422	SC-E-025A-00	✓
IDEC MicroSmart	RS232	SC-E-025B-00	✓
Keyence KV Series	RS232	SC-E-018-00	✓
Koyo DL205	RS232	SC-E-005-00	X
LG-Master K Series	RS232	SC-E-037-00	X
Mitsubishi FX0	RS485	SC-E-008A-00	✓
Modbus Slave	RS232/RS485*	User Supplied	Multidropping
Omron (Host Link) - 9 pin	RS232	SC-E-006B-00	✓
Omron (Host Link) - 25 pin	RS232	SC-E-006C-00	✓
Siemens S7-200 / Micro	RS485	SC-E-029-00	✓
Telemecanique TSX07/37	RS422	SC-E-026A-00	Network
Telemecanique TSX17	RS485	SC-E-017A-00	X
Toshiba T1	RS232	SC-E-019A-00	✓
Toshiba T2	RS232	SC-E-019B-00	✓

* Software selectable. New PLC drivers are constantly added. Please contact factory for more information. We welcome an opportunity to develop new , custom drivers and customized units.

Installation and Wiring

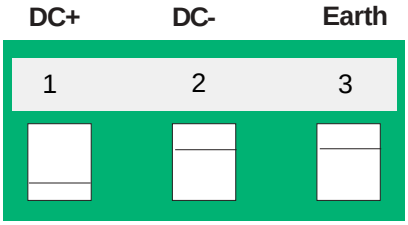
In this chapter. . .

- Hardware Installation
- Communication Port Details

5.0 Hardware Installation

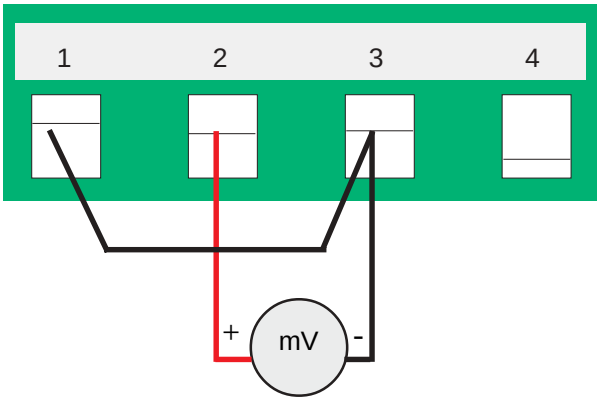
Use separate 24V DC, 3.5Watt regulated power supply for Eagle unit. Using common supply for the unit as well as i/p sensors (if any) may damage the i/p channel of the unit.

Before connecting 24V DC supply, check the positive and negative polarity as shown on the unit.

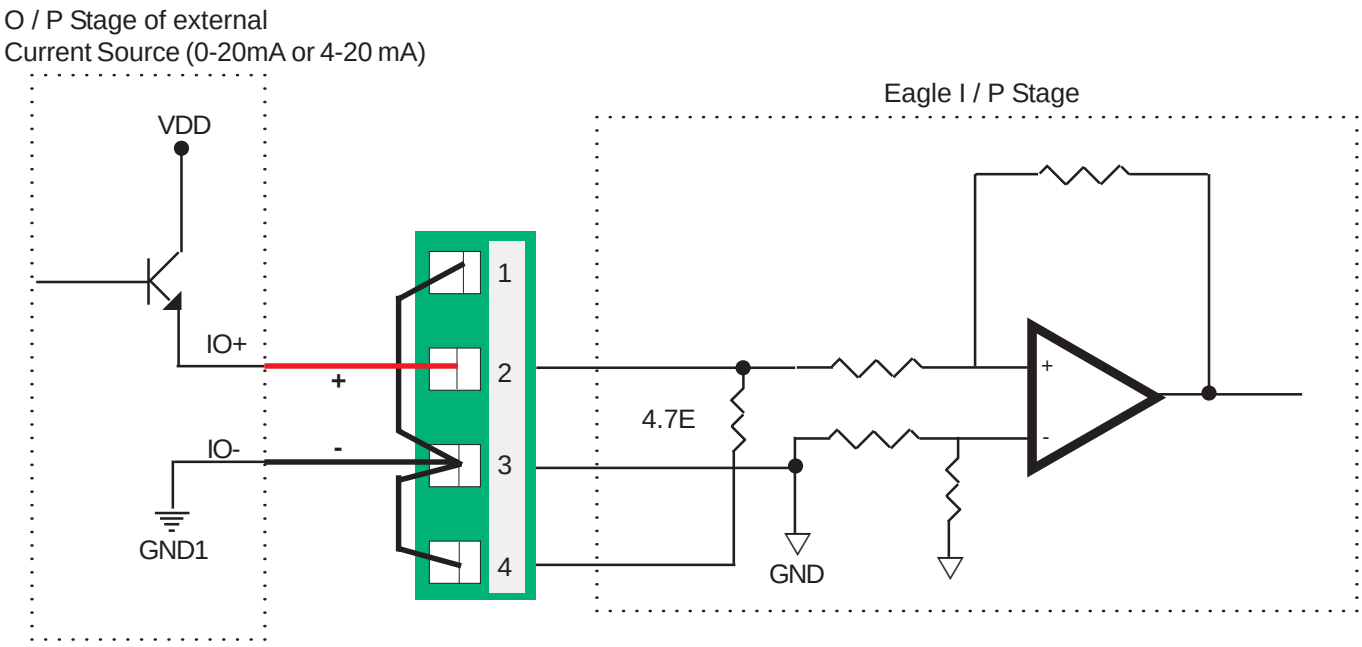


Power ON the unit. 'READY' LED will be ON . Refer Troubleshooting Guide for different LED Indications. Connect PLC cable between PLC PORT of Eagle and the PLC. This is dedicated cable for particular PLC and is supplied along with the unit. Refer Cable Part number list for more details. (Section No.7.0).
Power ON the PLC. If the driver for respective PLC is already downloaded in the unit, then Eagle will start communicating with the PLC. Then download the channel configuration as per the application through Eagle setup s/w.(PLC driver will be downloaded alongwith the channel configuration) (Refer Section No.3.1 for unit configuration)
Make connections to the required Input and/or Output channels as per the configuration downloaded in the unit.
Connections for different types of I / Ps are shown on the unit and are as follows-

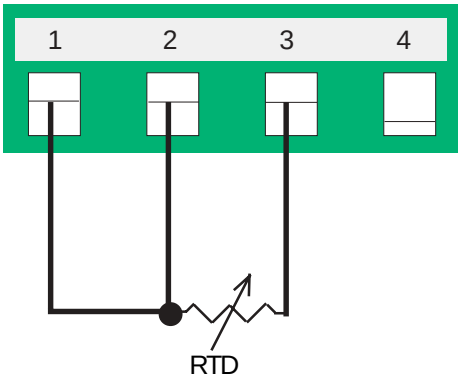
For Voltage Input (0-50mV or 0-100mV):



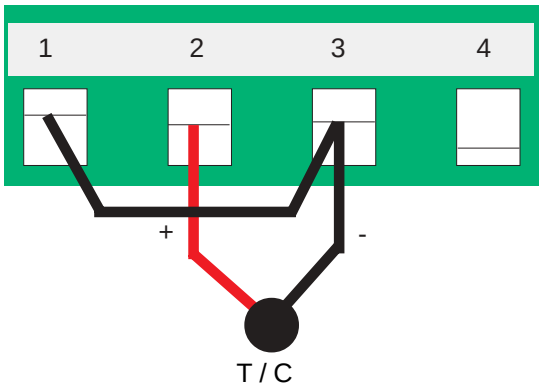
For Current Input (0-20mA or 4-20 mA)



For RTD Input

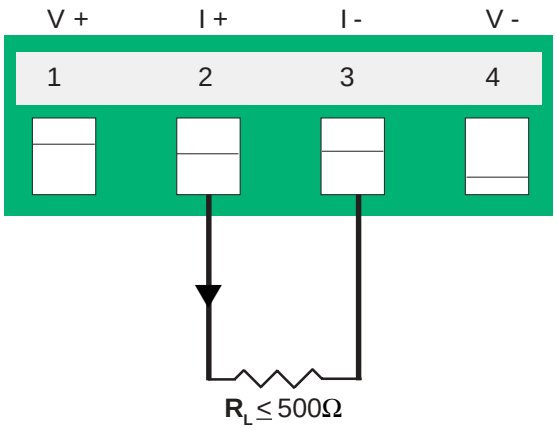


For Thermocouple Input

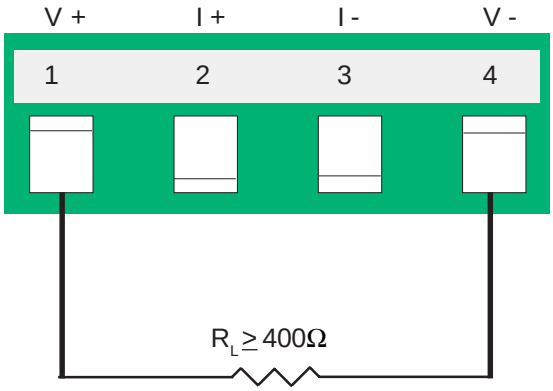


Output Connections:

Current Output (4-20 mA): Maximum load variation for stable current output is 0-500 ohm.

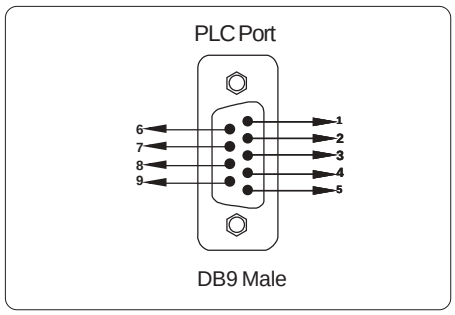


Voltage Output (0-10 V DC): Minimum load requirement for voltage o/p is 400 ohm.

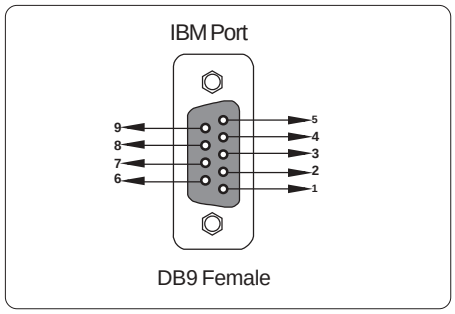


5.1 Communication Port Details

For Eagle 0404 / Eagle 0800;

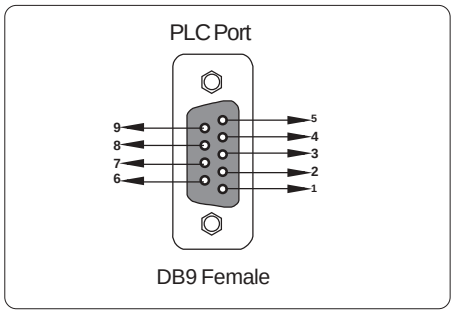


PIN #	Signal Name	Signal Description
1	TX+	RS-485 transmit positive
2	RX+	RS-485 receive positive
3	TXD	RS-232 transmit line
4	NC	NC
5	GND	GND
6	TX-	RS-485 transmit negative
7	RX-	RS-485 receive negative
8	RXD	RS-232 receive line
9	NC	NC

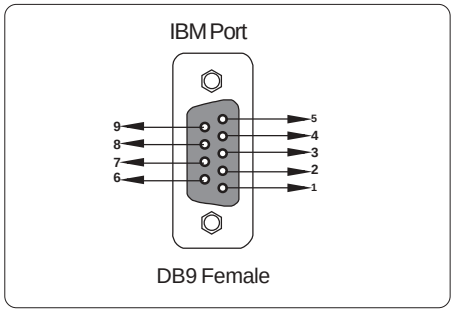


PIN #	Signal Name	Signal Description
1	NC	NC
2	TXD	RS-232 Transmit
3	RXD	RS-232 Receive
4	NC	NC
5	GND	GND
6	NC	NC
7	NC	NC
8	NC	NC
9	GND	GND

For Eagle 0201#:



PIN #	Signal Name	Signal Description
1	TX+	RS-485 transmit positive
2	TXD	RS-232 Transmit
3	RXD	RS-232 Receive
4	RX+	RS-485 receive positive
5	GND	GND
6	NC	NC
7	PLC-CMOS	CMOS
8	TX-	RS-485 transmit negative
9	RX-	RS-485 receive negative



PIN #	Signal Name	Signal Description
1	NC	NC
2	TXD	RS-232 Transmit
3	RXD	RS-232 Receive
4	NC	NC
5	GND	GND
6	NC	NC
7	NC	NC
8	NC	NC
9	NC	NC

Modbus Configuration

In this chapter. . .

- Eagle as Modbus RTU Slave

6.0 Modbus RTU Slave Eagle

In the MODBUS SLAVE configuration, Eagle supports following commands.

"03" READ HOLDING REGISTERS

Command and response format for this command is as follows.

Command from Master:		**Response from Slave (EAGLE)**	
Field	**Example (Hex)**	**Field**	**Example (Hex)**
Slave address	01	Slave address	01
Function	03	Function	03
Start address (High)	00	Byte Count	02
Start address (Low)	64	Data for channel (1)(High)	XX
No.of words (High)	00	Data for channel (1)(Low)	XX
No.of words (Low)	01	CRC (Low)	
CRC (Low)	XX	CRC (High)	
CRC (High)	XX		

** Master can send this command with the address 000A Hex to read the continuous channel data e.g. if the Master sends 03 command with starting address 000A Hex and No.of words 08H, Eagle will send data of all eight input channels to the Master.

"06" Preset Single Holding Resisters

Command and response format for this command is as follows.

Command from Master:		**Response from Eagle (Slave)**	
Field	**Example (Hex)**	**Field**	**Example (Hex)**
Slave address	01	Slave address	01
Function	06	Function	06
Register address (High)	00	Register address (High)	00
Register address (Low)	64	Register address (Low)	64
Preset Data (High)	00	Preset Data (High)	00
Preset Data (low)	01	Preset Data (Low)	01
CRC (Low)	XX	CRC (Low)	XX
CRC (High)	XX	CRC (High)	XX

"16 (10 Hex)" **Preset Multiple Holding Registers (For RENU Special Modbus Driver)**

Command from Master		**Response from Eagle (Slave):**	
Field	**Example (Hex)**	**Field**	**Example (Hex)**
Slave address	01	Slave address	01
Function	10	Function	10
Start address (High)	07	Start address (High)	07
Start address (Low)	D1	Start address (Low)	D1
No.of words (High)	00	No.of words (High)	00
No.of words (Low)	02	No. of words (Low)	02
Byte Count	04	CRC (Low)	XX
Data for channel 1(High)	xx	CRC (High)	XX
Data for channel 1(Low)	xx		
Data for channel 2(High)	xx		
Data for channel 2(Low)	xx		
CRC Hi	xx		
CRC Lo	xx		

For Modbus RTU Slave Driver, following are the tag addresses:
For Single register length:

I/P Channel No.	**Holding Regsister**
1	400101
2	400301
3	400501
4	400701
5	400901
6	401101
7	401301
8	401501

O/P Channel No.	**Holding Register**
1	402001
2	402003
3	402005
4	402007

For Multiple register length:

I/P Channel No.	**Holding Regsister**
1	400011
2	400012
3	400013
4	400014
5	400015
6	400016
7	400017
8	400018

Note: Multiple register length is not supported for output channels in Modbus RTU slave driver.

For "RENU Special Driver" following are the tag addresses for both the 'single' and 'multiple' register length:

I/P Channel No.	**Holding Regsister**
1	400011
2	400012
3	400013
4	400014
5	400015
6	400016
7	400017
8	400018

O/P Channel No.	**Holding Regsister**
1	402002
2	402003
3	402004
4	402005

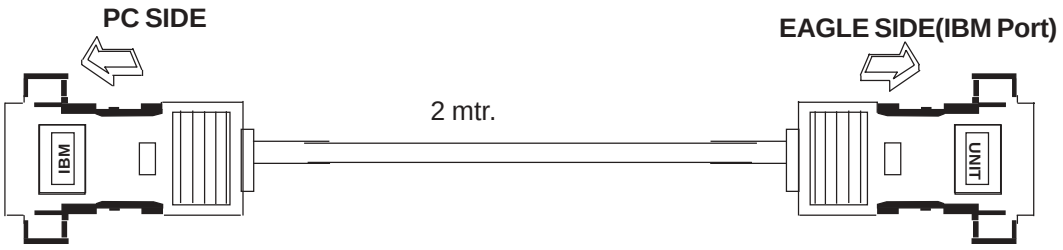
CABLE DIAGRAMS

In this chapter. . .

- Communication Cable Diagrams for Eagle

7.0 IBM Cable Diagrams

PC TO EAGLE IBM PORT CABLE:
For Eagle 0404 / 0800 and for Eagle 0201#



DB9 FEMALE (RS232)

SIGNALS	Pin #
	1
RXD	2
TXD	3
	4
SG	5
	6
	7
	8
	9

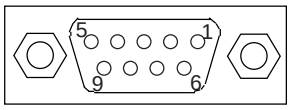
Shield Wire

Shield Wire

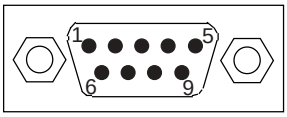
DB9 MALE (RS232)

Pin #	SIGNALS
1	
2	TXD
3	RXD
4	
5	SG
6	
7	
8	
9	

DB9 FEMALE PINOUTS

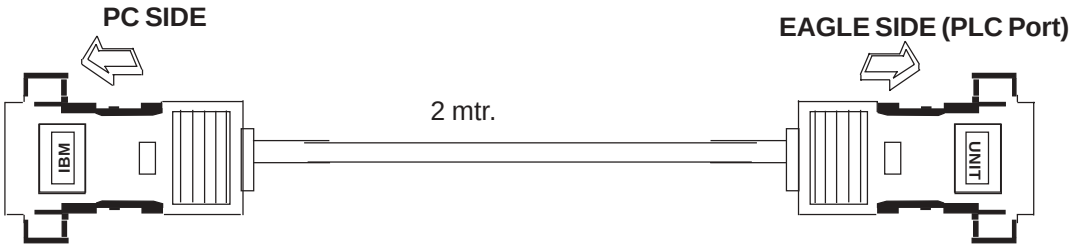


DB9 MALE PINOUTS



7.1 PC to Eagle PLC Port Cable Diagrams

For Eagle 0404 / 0800:



DB9 FEMALE (RS232)

SIGNALS	Pin #
	1
RXD	2
TXD	3
	4
SG	5
	6
	7
	8
	9

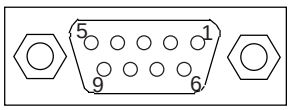
Shield Wire

DB9 FEMALE (RS232)

Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

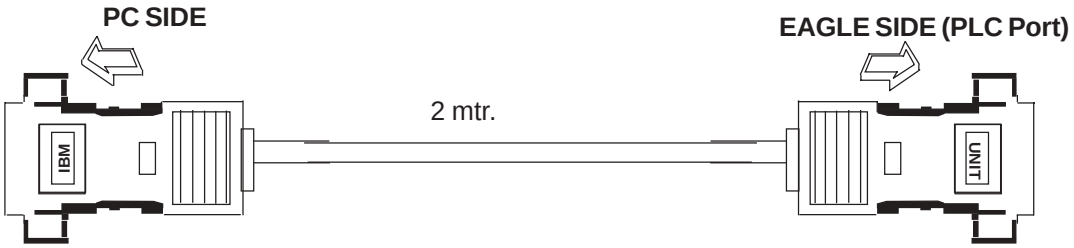
Shield Wire

DB9 FEMALE PINOUTS



PC to Eagle PLC Port Cable Diagrams

For Eagle 0201#



DB9 FEMALE (RS232)

SIGNALS	Pin #
	1
RXD	2
TXD	3
	4
SG	5
	6
	7
	8
	9

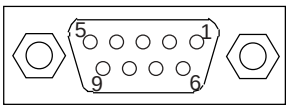
Shield Wire

Shield Wire

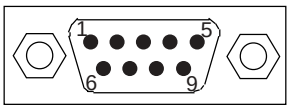
DB9 MALE (RS232)

Pin #	SIGNALS
1	
2	TXD
3	RXD
4	
5	SG
6	
7	
8	
9	

DB9 FEMALE PINOUTS

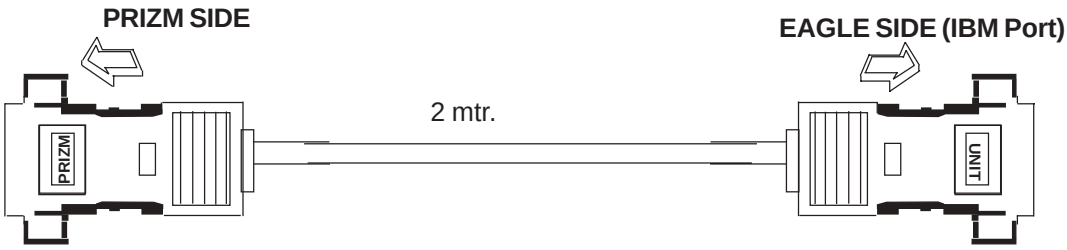


DB9 MALE PINOUTS



7.2 Prizm to Eagle IBM Port Cable Diagrams

For Eagle 0404 / 0800 and for Eagle 0201#



DB9 MALE (RS232)

SIGNALS	Pin #
	1
TXD	2
RXD	3
	4
SG	5
	6
	7
	8
	9

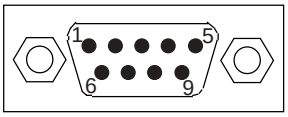
Shield Wire

DB9 MALE (RS232)

Pin #	SIGNALS
1	
2	TXD
3	RXD
4	
5	SG
6	
7	
8	
9	

Shield Wire

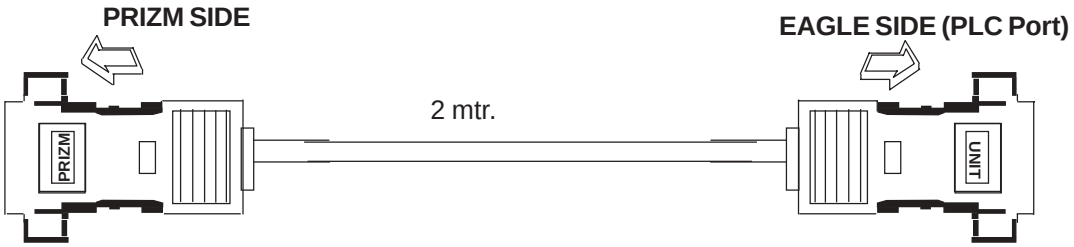
DB9 MALE PINOUTS



Note: For HMI, short pin 5 and pin 9 at the HMI communication port.

7.3 Prizm to Eagle PLC Port Cable Diagrams

RS232 Cable For Eagle 0404 / 0800



DB9 MALE (RS232)

SIGNALS	Pin #
	1
TXD	2
RXD	3
	4
SG	5
	6
	7
	8
	9

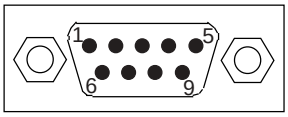
Shield Wire

DB9 FEMALE (RS232)

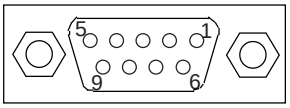
Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

Shield Wire

DB9 MALE PINOUTS

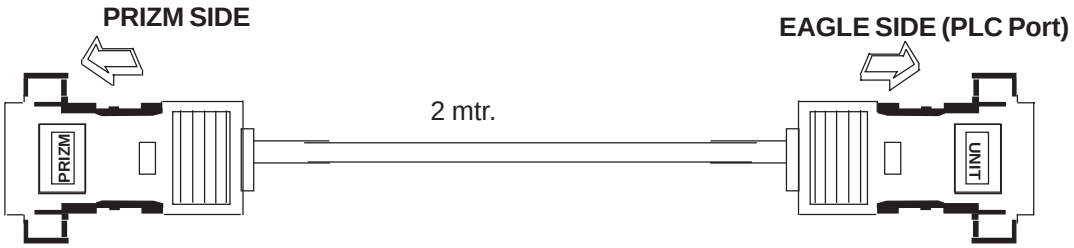


DB9 FEMALE PINOUTS



Prizm to Eagle PLC Port Cable Diagrams

RS232 Cable for Eagle 0201#



DB9 MALE (RS232)

SIGNALS	Pin #
	1
TXD	2
RXD	3
	4
SG	5
	6
	7
	8
	9

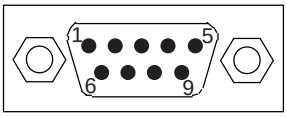
Shield Wire

DB9 FEMALE (RS232)

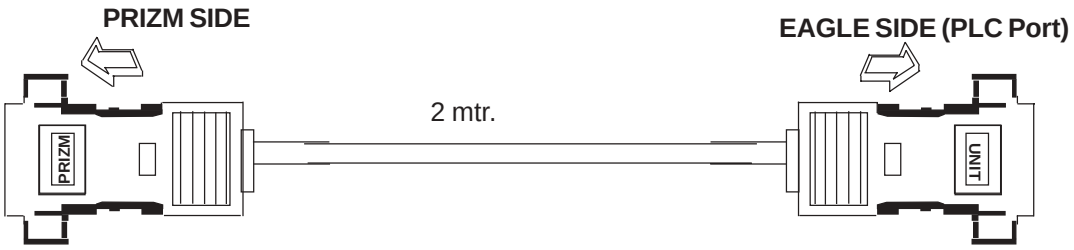
Pin #	SIGNALS
1	
2	TXD
3	RXD
4	
5	SG
6	
7	
8	
9	

Shield Wire

DB9 MALE PINOUTS



2 Wire RS485 Cable For Eagle 0404 / 0800



DB9 MALE (RS422)

SIGNALS	Pin #
TX+	1
	2
	3
RX+	4
SG	5
	6
	7
TX-	8
RX-	9

Shield Wire

DB9 FEMALE (RS422)

Pin #	SIGNALS
1	TX+
2	RX+
3	
4	
5	SG
6	TX-
7	RX-
8	
9	

A

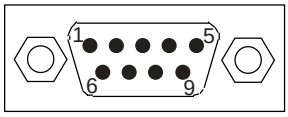
A

B

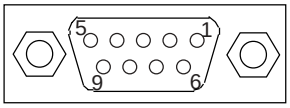
B

Shield Wire

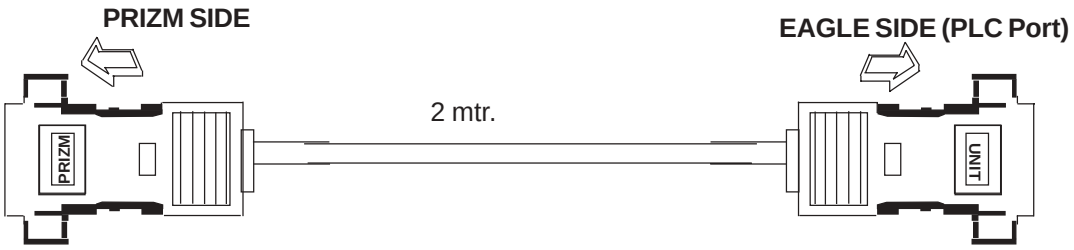
DB9 MALE PINOUTS



DB9 FEMALE PINOUTS



2 Wire RS485 Cable For Eagle 0201#



DB9 MALE (RS422)

SIGNALS	Pin #
TX+	1
	2
	3
RX+	4
SG	5
	6
	7
TX-	8
RX-	9

Shield Wire

DB9 MALE (RS422)

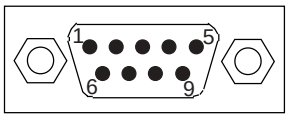
Pin #	SIGNALS
1	TX+
2	
3	
4	RX+
5	SG
6	
7	
8	TX-
9	RX-

A — A

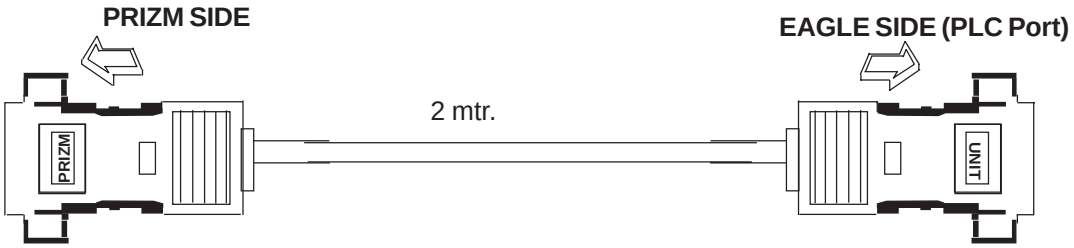
B — B

Shield Wire

DB9 MALE PINOUTS



4 Wire RS485 Cable For Eagle 0404 / 0800



DB9 MALE (RS485)

SIGNALS	Pin #
TX+	1
	2
	3
RX+	4
SG	5
	6
	7
TX-	8
RX-	9

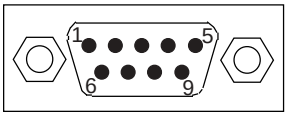
Shield Wire

Shield Wire

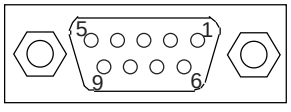
DB9 FEMALE (RS485)

Pin #	SIGNALS
1	TX+
2	RX+
3	
4	
5	SG
6	TX-
7	RX-
8	
9	

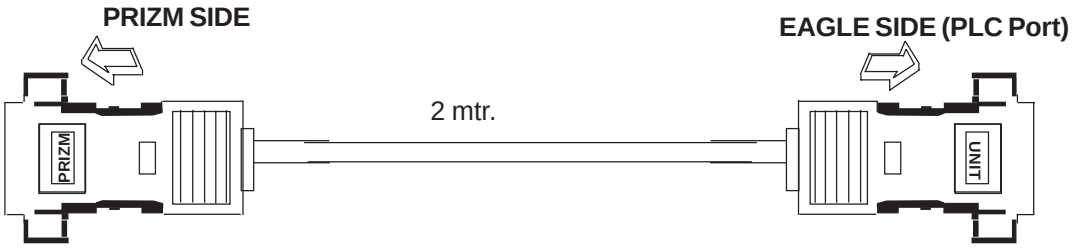
DB9 MALE PINOUTS



DB9 FEMALE PINOUTS



4 Wire RS485 Cable For Eagle 0201#



DB9 MALE (RS422)

SIGNALS	Pin #
TX+	1
	2
	3
RX+	4
SG	5
	6
	7
TX-	8
RX-	9

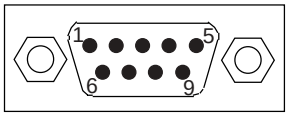
Shield Wire

DB9 MALE (RS422)

Pin #	SIGNALS
1	TX+
2	
3	
4	RX+
5	SG
6	
7	
8	TX-
9	RX-

Shield Wire

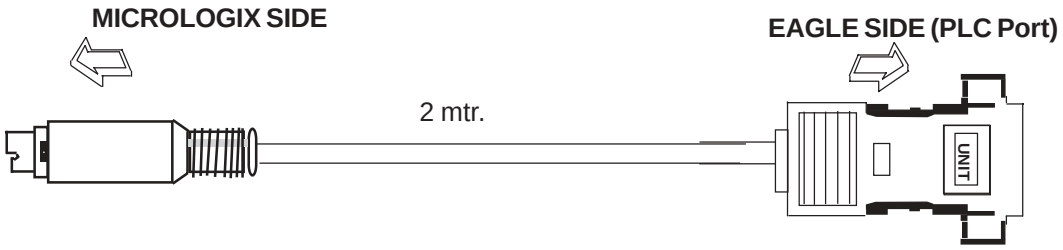
DB9 MALE PINOUTS



7.4 Non-Modbus Communication Cable Diagrams

Note: In case of non-modbus communication cable drawings; for Eagle 0201# product; contact factory.

7.4.1 MICROLOGIX PLC (MINIDIN) to Eagle 0404 / 0800 (SC-E-027A-00):



8 PIN MINIDIN (RS232)

SIGNALS	Pin #
	1
GND	2
	3
RXD	4
	5
	6
TXD	7
	8

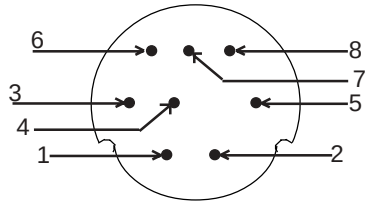
Shield Wire

DB9 FEMALE (RS232)

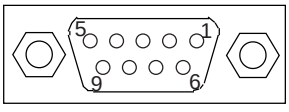
Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

Shield Wire

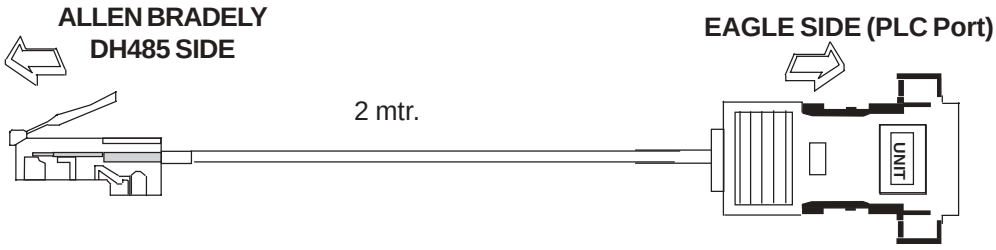
8 PIN MINIDIN CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.2 ALLEN BRADELY DH485 to Eagle 0404 / 0800 (SC-E-007-00):



8 PIN MODULAR CONNECTOR (RS422)

SIGNALS	Pin #
A	1
B	2
	3
	4
	5
	6
SG	7
	8

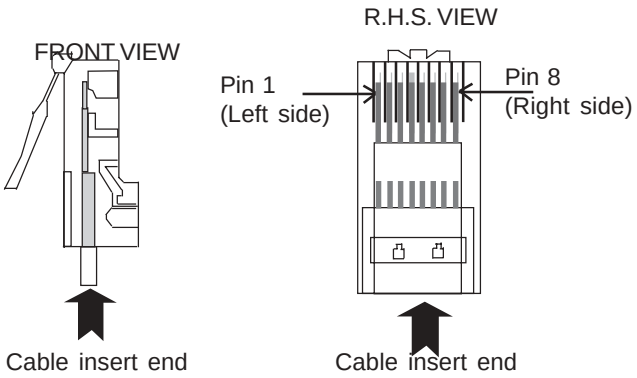
Shield Wire

DB9 FEMALE (RS422)

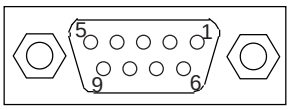
Pin #	SIGNALS
1	TX+
2	RX+
3	
4	
5	SG
6	TX-
7	RX-
8	
9	

Shield Wire

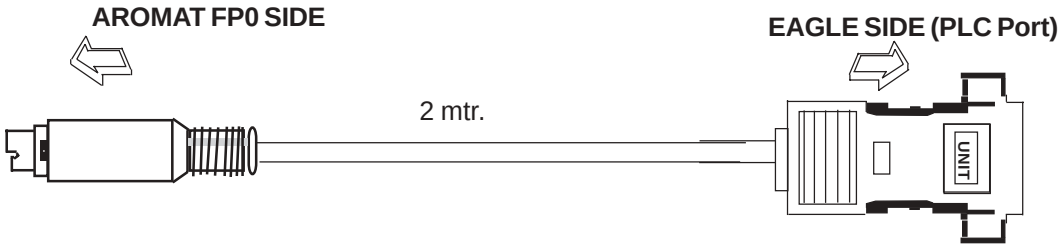
8 PIN MODULAR CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.3 AROMAT FP0/FPM to Eagle 0404 / 0800 (SC-E-015A-00):



5 PIN MINIDIN (RS232)

SIGNALS	Pin #
SG	1
TXD	2
RXD	3
	4
	5

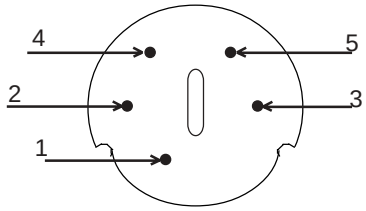
Shield Wire

DB9 FEMALE (RS232)

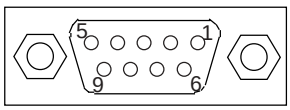
Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

Shield Wire

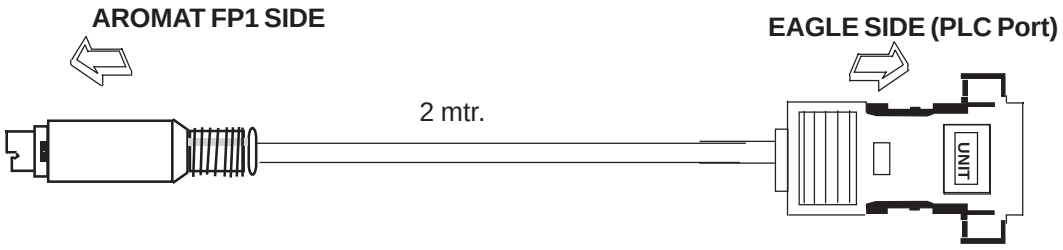
5 PIN MINIDIN CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.4 AROMAT FP1 to Eagle 0404 / 0800 (SC-E-015B-00):



DIN CONNECTOR MALE (RS485)

SIGNALS	Pin #
SG	1
TX-	2
RX-	3
	4
TX+	5
RX+	6
	7
	8

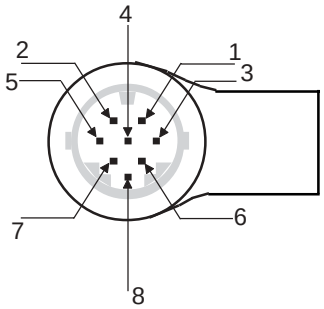
Shield Wire

Shield Wire

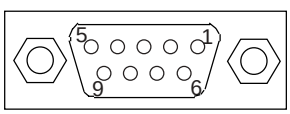
DB9 FEMALE (RS485)

Pin #	SIGNALS
1	TX+
2	RX+
3	
4	
5	SG
6	TX-
7	RX-
8	
9	

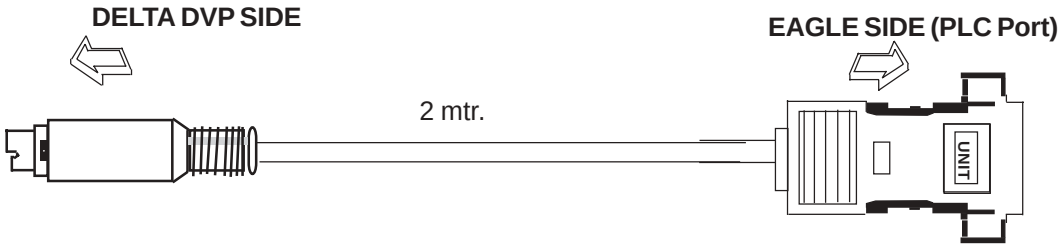
DIN CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.5 DELTA DVP PLC to Eagle 0404 / 0800 (SC-E-044-00):



8 PIN MINIDIN (RS232)

SIGNALS	Pin #
	1
	2
	3
RXD	4
TXD	5
	6
	7
SG	8

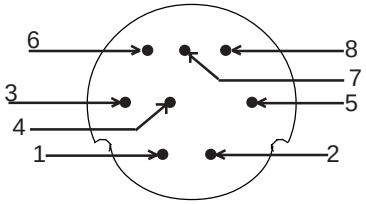
Shield Wire

DB9 FEMALE (RS232)

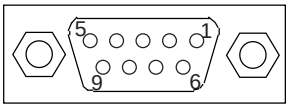
Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

Shield Wire

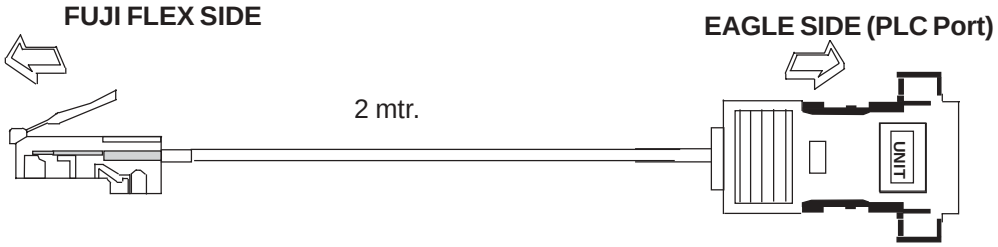
8 PIN MINIDIN CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.6 FUJI FLEX to Eagle 0404 / 0800 (SC-E-028-00):



8 PIN MODULAR CONNECTOR (RS485)

SIGNALS	Pin #
	1
	2
TX+	3
TX-	4
RX+	5
RX-	6
	7
SG	8

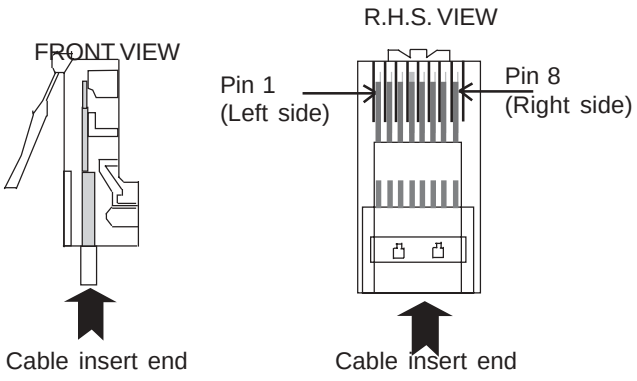
Shield Wire

DB9 FEMALE (RS485)

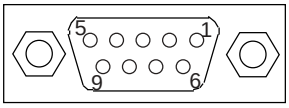
Pin #	SIGNALS
1	TX+
2	RX+
3	
4	
5	SG
6	TX-
7	RX-
8	
9	

Shield Wire

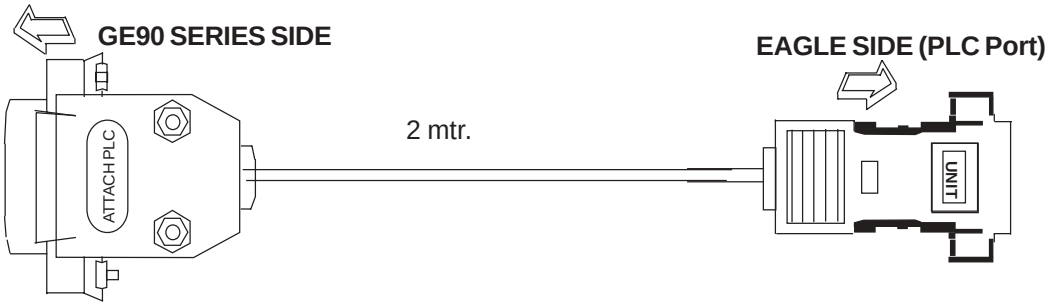
8 PIN MODULAR CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.7 GE 90 SERIES PLC to Eagle 0404 / 0800 (SC-E-002-00):



DB15 MALE (RS485)

SIGNALS	Pin #
EARTH	1
	2
	3
	4
	5
	6
SG	7
	8
	9
RX-	10
RX+	11
TX-	12
TX+	13
	14
	15

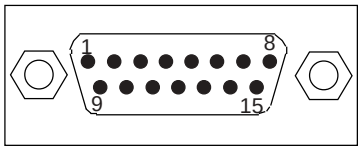
Shield Wire

Shield Wire

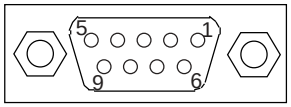
DB9 FEMALE (RS485)

Pin #	SIGNALS
1	TX+
2	RX+
3	
4	
5	SG
6	TX-
7	RX-
8	
9	

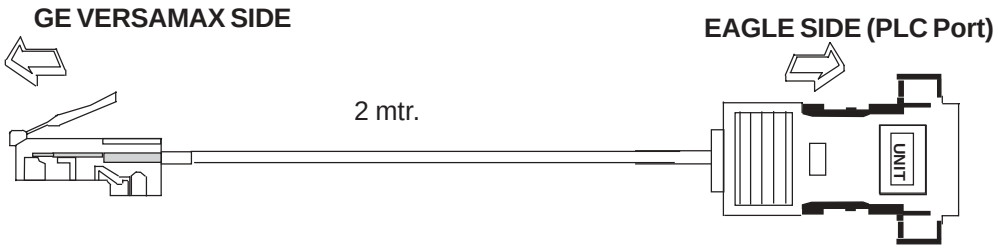
DB15 MALE CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.8 GE VERSAMAX PLC to Eagle 0404 / 0800 (SC-E-002A-00):



8 PIN MODULAR CONNECTOR (RS232)

SIGNALS	Pin #
SG	1
	2
	3
	4
TXD	5
RXD	6
	7
	8

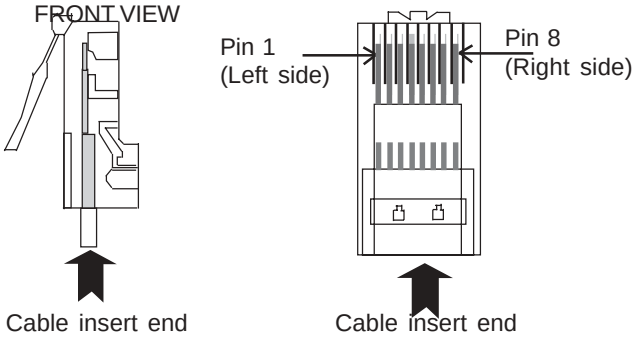
Shield Wire

DB9 FEMALE (RS232)

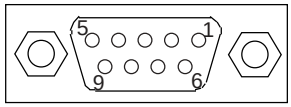
Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

Shield Wire

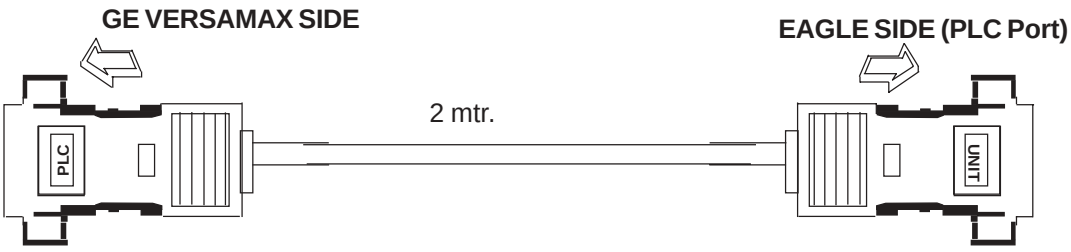
8 PIN MODULAR CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.9 GE VERSAMAX PLC to Eagle 0404 / 0800 (SC-E-002B-00):



DB9 MALE (RS232)

SIGNALS	Pin #
	1
TXD	2
RXD	3
	4
SG	5
	6
	7
	8
	9

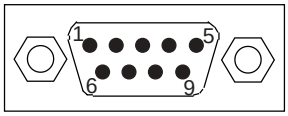
Shield Wire

DB9 FEMALE (RS232)

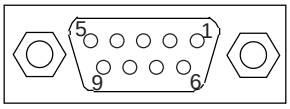
Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

Shield Wire

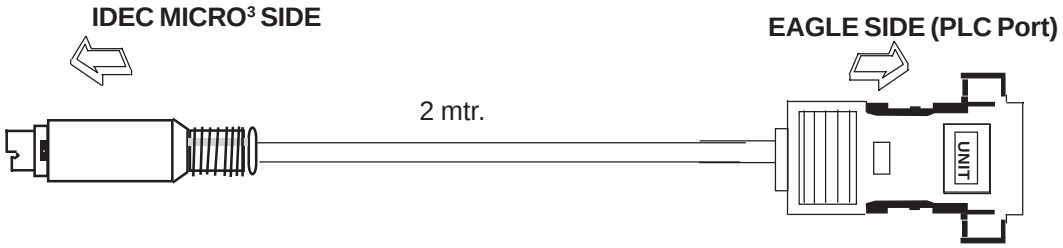
DB9 MALE PINOUTS



DB9 FEMALE PINOUTS



7.4.10 IDEC MICRO³ PLC to Eagle 0404 / 0800 (SC-E-025A-00):



8 PIN MINIDIN (RS422)

SIGNALS	Pin #
A	1
B	2
	3
	4
	5
	6
SG	7
	8

Shield Wire

DB9 FEMALE (PLC Port) (RS422)

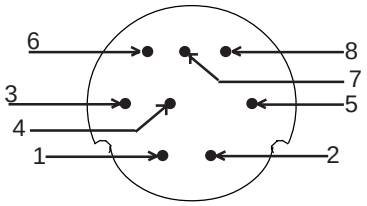
Pin #	SIGNALS
1	TX+
2	RX+
3	
4	
5	SG
6	TX-
7	RX-
8	
9	

A

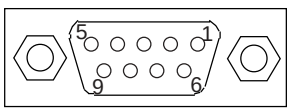
B

Shield Wire

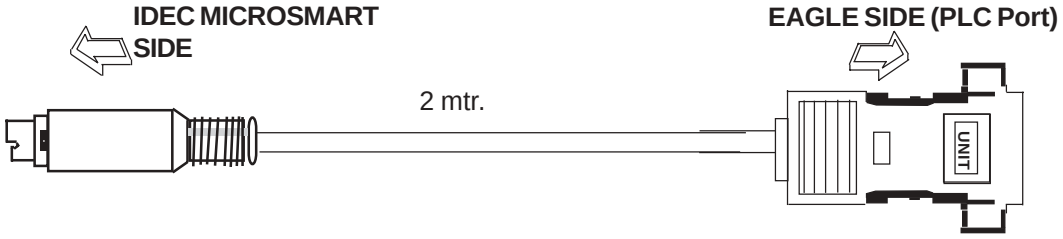
8 PIN MINIDIN CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.11 IDEC MICROSMART PLC to Eagle 0404 / 0800 (SC-E-025B-00):



8 PIN MINIDIN (RS232)

SIGNALS	Pin #
	1
	2
TXD	3
RXD	4
	5
SG	6
SG	7
	8

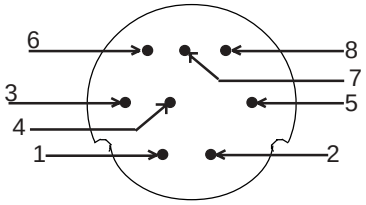
Shield Wire

DB9 FEMALE (PLC Port) (RS232)

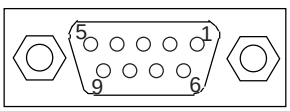
Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

Shield Wire

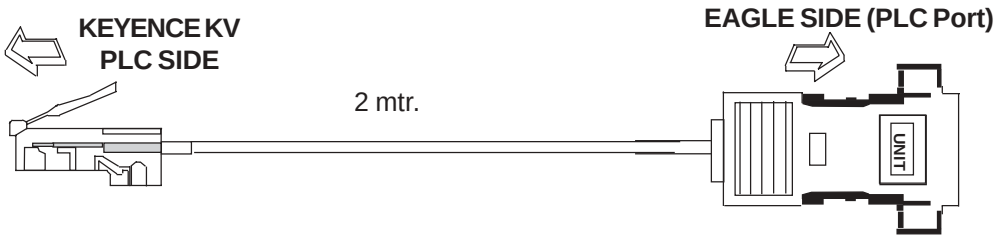
8 PIN MINIDIN CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.12 KEYENCE KV PLC to Eagle 0404 / 0800 (SC-E-018-00):



6X4 MODULAR CONNECTOR (RS232)

SIGNALS	Pin #
TXD	1
SG	2
RXD	3
	4

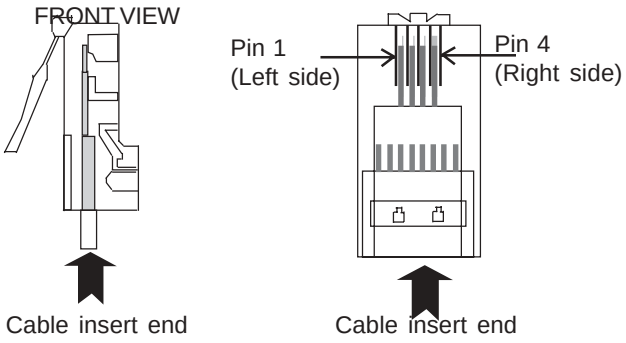
Shield Wire

DB9 FEMALE (RS232)

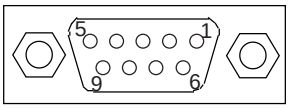
Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

Shield Wire

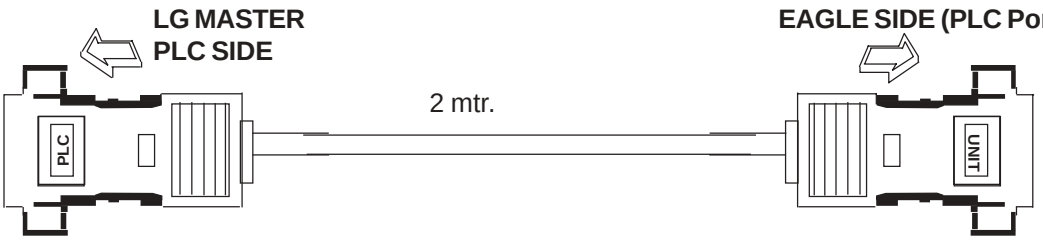
6X4 MODULAR CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.13 LG MASTER-K SERIES PLC to Eagle 0404 / 0800 (SC-E-037-00):



DB9 MALE (RS232)

SIGNALS	Pin #
	1
RXD	2
TXD	3
	4
SG	5
	6
	7
	8
	9

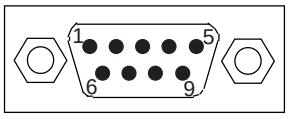
Shield Wire

DB9 FEMALE (RS232)

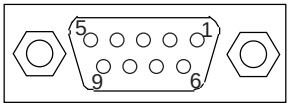
Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

Shield Wire

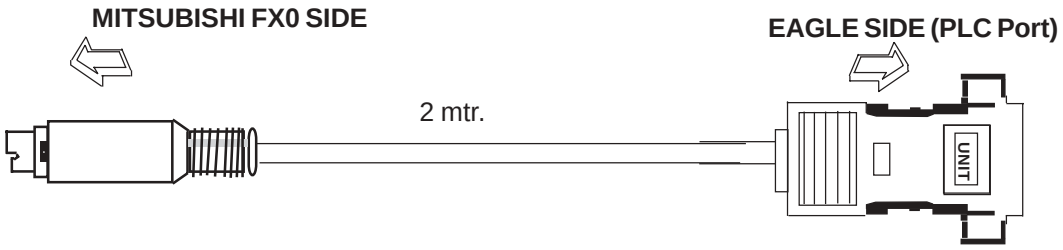
DB9 MALE PINOUTS



DB9 FEMALE PINOUTS



7.4.14 MITSUBISHI FX0 PLC to Eagle 0404 / 0800 (SC-E-008A-00):



8 PIN MINIDIN (RS485)

SIGNALS	Pin #
RX-	1
RX+	2
SG	3
TX-	4
	5
	6
TX+	7
	8

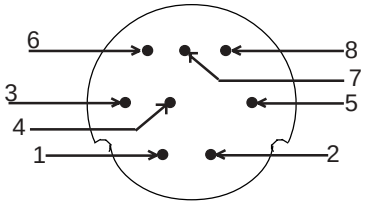
Shield Wire

DB9 FEMALE (PLC Port) (RS485)

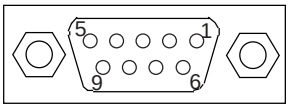
Pin #	SIGNALS
1	TX+
2	RX+
3	
4	
5	SG
6	TX-
7	RX-
8	
9	

Shield Wire

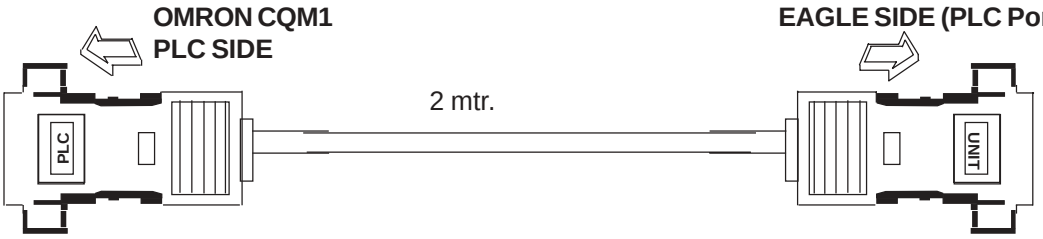
8 PIN MINIDIN CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.15 OMRON CQM1 PLC to Eagle 0404 / 0800 (SC-E-006B-00):



DB9 MALE (RS232)

SIGNALS	Pin #
EARTH	1
TXD	2
RXD	3
	4
	5
	6
	7
	8
SG	9

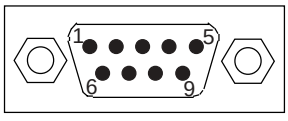
Shield Wire

DB9 FEMALE (RS232)

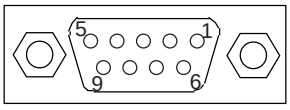
Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

Shield Wire

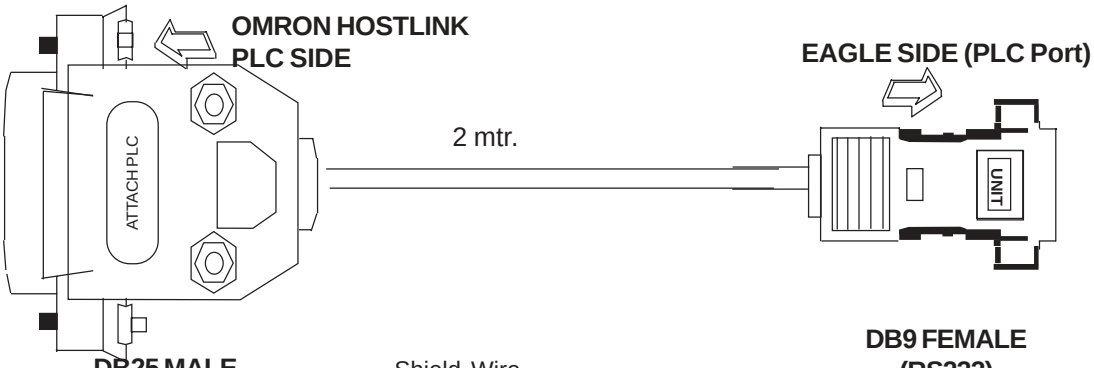
DB9 MALE PINOUTS



DB9 FEMALE PINOUTS



7.4.16 OMRON HOSTLINK to Eagle 0404 / 0800 (SC-E-006C-00):



DB25 MALE (RS232)

SIGNALS	Pin #
FRAME GND	1
TXD	2
RXD	3
RS	4
CS	5
	6
GND	7
	8
	9
	10
	11
	12
	13
	14
	15
	16
	17
	18
	19
	20
	21
	22
	23
	24
	25

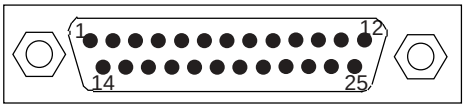
Shield Wire

Shield Wire

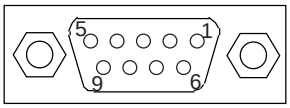
DB9 FEMALE (RS232)

Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

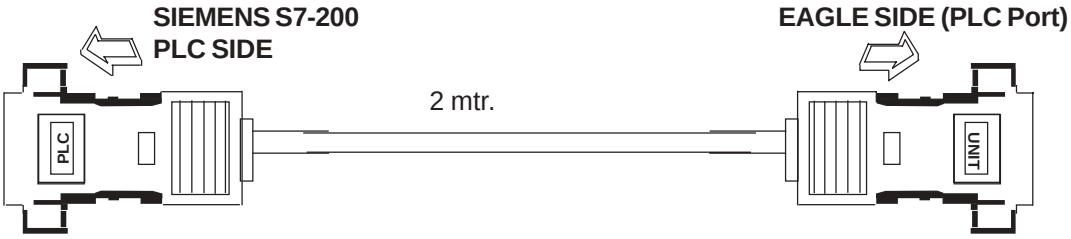
DB25 MALE PINOUTS



DB9 FEMALE PINOUTS



7.4.17 SIEMENS STEP-7 MICRO (S7-200) PLC to Eagle 0404 / 0800 (SC-E-029-00):



DB9 MALE (RS422)

SIGNALS	Pin #
	1
	2
A	3
	4
SG	5
	6
	7
B	8
	9

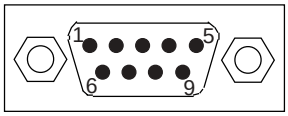
Shield Wire

DB9 FEMALE (RS422)

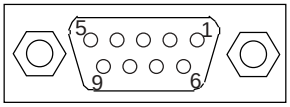
Pin #	SIGNALS
1	TX+
2	RX+
3	
4	
5	SG
6	TX-
7	RX-
8	
9	

Shield Wire

DB9 MALE PINOUTS

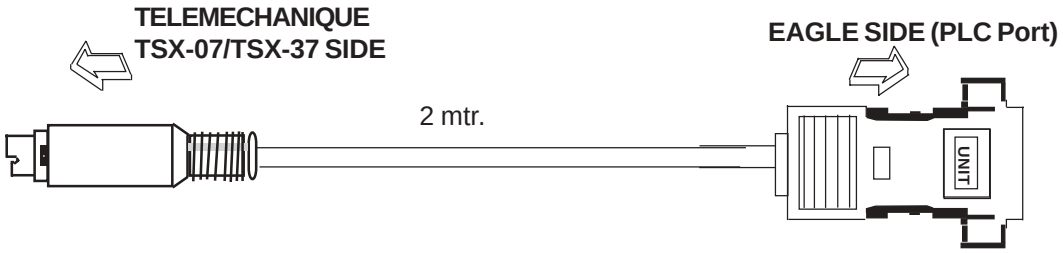


DB9 FEMALE PINOUTS



Note: These details are also applicable for Siemens S7-300.

7.4.18 TELEMECHANIQUE TSX-07/TSX-37 PLC to Eagle 0404 / 0800 (SC-E-026A-00):



8 PIN MINIDIN (RS422)

SIGNALS	Pin #
A	1
B	2
	3
	4
	5
	6
GND	7
	8

Shield Wire

DB9 FEMALE (RS422)

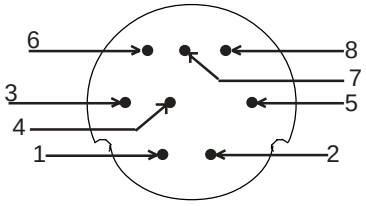
Pin #	SIGNALS
1	TX+
2	RX+
3	
4	
5	SG
6	TX-
7	RX-
8	
9	

A

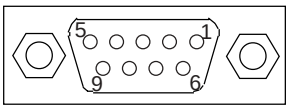
B

Shield Wire

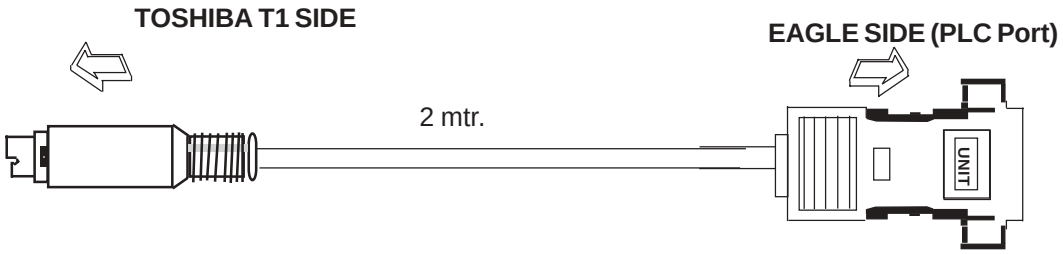
8 PIN MINIDIN CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.19 TOSHIBA T1 PLC to Eagle 0404 / 0800 (SC-E-019A-00):



8 PIN MINIDIN (RS232)

SIGNALS	Pin #
	1
	2
	3
	4
SG	5
TXD	6
	7
RXD	8

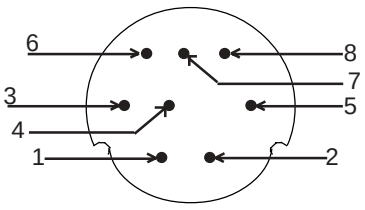
Shield Wire

Shield Wire

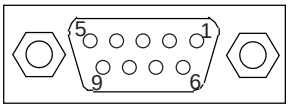
DB9 FEMALE (RS232)

Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

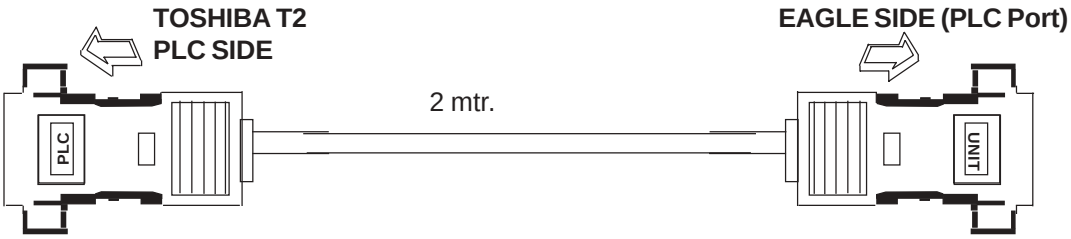
8 PIN MINIDIN CONNECTOR PINOUTS



DB9 FEMALE PINOUTS



7.4.20 TOSHIBA T2 PLC to Eagle 0404 / 0800 (SC-E-019B-00):



DB9 MALE (RS232)

SIGNALS	Pin #
	1
RXD	2
TXD	3
	4
SG	5
	6
	7
	8
	9

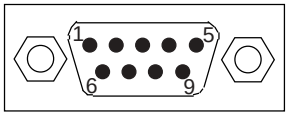
Shield Wire

DB9 FEMALE (RS232)

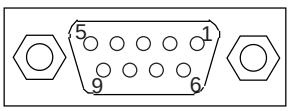
Pin #	SIGNALS
1	
2	
3	TXD
4	
5	SG
6	
7	
8	RXD
9	

Shield Wire

DB9 MALE PINOUTS



DB9 FEMALE PINOUTS



FAQs

In this chapter. . .

- Frequently asked Questions for Eagle

8.0 Frequently asked questions for Eagle

Q. What are the different types of Analog inputs and outputs Eagle series supports?
Ans. Eagle series supports four types of Analog inputs and two types of Analog outputs.
They are:
Analog input types:
- Current Inputs:
  - a) 0 to 20 mA (linear and non-linear)
  - b) 4 to 20 mA (linear and non-linear)
- Voltage Inputs:
  - a) 0 to 50 mV (linear and non-linear)
  - b) 0 to 100 mV (linear and non-linear)
- RTD Input:
  - a) RTD's (Alpha 1, Alpha 2)
- Thermocouple:
  - a) Types: J, K, E, R, S, B, N and T

Analog output types:
- Current Output:
  - a) 4 to 20 mA
- Voltage Output:
  - a) 0 to 10 VDC

Q. How Analog input / output channels are mapped with the PLC Register?
Ans. For Input Channels, one of the PLC Data Registers should be assigned as Input ADC Register where the information for the first channel will be stored in the PLC. The following registers will have the data for the other input channels. Similar concept is used for output register also.

Q. What are the ranges for digital values downloaded in the PLC input ADC Register?
Ans. Different ranges based on the Analog inputs are as mentioned below:
a) Milli Volts (0-100mV or 0-50 mV): 0 to 4095 decimal
b) Milli Amperes (0-20mA or 4-20 mA): 0 to 4095 decimal
c) Thermocouples & RTD's: Actual field values in degree centigrade multiplied by 10 is used for Thermocouple and RTD type inputs.
In case of non-linear inputs, Eagle will download the engineering value entered by user multiplied by 10 into the PLC.

Q. Can I have combinations of different types of inputs?
Ans. Yes, you can. All the input channels of Eagle are user configurable and any combination of input types is possible. You can define different channels to Analog inputs like RTD, Thermocouple, mA and mV. All these inputs can be connected to Eagle at a time.

Q. Can I connect multiple Eagles to HMI Software / SCADA?
Ans. Yes, you can. Up to 32 Eagle units can be connected on RS 485 Modbus network. Define Eagle units as Modbus RTU Slaves. Each Eagle unit will have unique slave ID. HMI Software / SCADA will be Modbus Master. In such applications Eagle units are connected on RS 485 multidrop mode for fast response.

Q. Can I connect Eagle on RS 485 Modbus network with other field devices?
Ans. Yes, You can. Eagles will be connected in the RS 485 network as Modbus slaves with other field devices such as Energy Meters, Temp. Controllers, Operator Panels etc.

Q. Can I connect multiple Eagles to Devices or PLC's that do not support Modbus? How?
Ans. Yes, you can.
In such applications REPL make Gateway (Protocol Converter) unit is used. Gateway has 2 communication ports that support RS 232 or RS 485. Gateway will convert PLCs' protocol to Modbus. One port of Gateway will be connected to PLC or non-Modbus device and other port will be Modbus Master. Multiple Eagles can be connected to Modbus Master port as Modbus slaves.

Q. Is it possible to connect two devices, Eagle and Prizm Operator Panel on the same port of the PLC?
Ans. Yes, it is possible. Connect Eagle to the programming port of the PLC and Operator Interface to the IBM port of Eagle (Slave Port). You can read / write / edit all the PLC registers and coils including Eagle channels by Prizm Operator Interface using Eagle pass through port.

Q. Can I connect two different models of Eagles in the same network?
Ans. Yes, you can.

Q. What is the default Modbus ADC addresses when Eagle is defined as Modbus Slave?
Ans. Modbus addresses for Input Channels are:
For Modbus RTU Slave Driver, following are the tag addresses:
For Single register length:

I/P Channel No.	Holding Regsister
1	400101
2	400301
3	400501
4	400701
5	400901
6	401101
7	401301
8	401501

O/P Channel No.	Holding Register
1	402001
2	402003
3	402005
4	402007

For Multiple register length:

I/P Channel No.	Holding Regsister
1	400011
2	400012
3	400013
4	400014
5	400015
6	400016
7	400017
8	400018

Note: Multiple register length is not supported for output channels in Modbus RTU slave driver.

For “RENU Special Driver” following are the tag addresses for both the ‘single’ and ‘multiple’ register length:

I/P Channel No.	Holding Regsister
1	400011
2	400012
3	400013
4	400014
5	400015
6	400016
7	400017
8	400018

O/P Channel No.	Holding Regsister
1	402002
2	402003
3	402004
4	402005

Q. Can I set the Baud rate and RS232 / RS485 communication levels in the Eagle setup software when defining Eagle as Modbus slave? How?
Ans. Yes, you can.
Select Eagle data button in the EDIT/ Setup menu. Set Level / baud between range of 0 to 3, where:

0 means RS232 Level and 9600-baud rate
1 means RS485 Level and 9600-baud rate
2 means RS232 Level and 19200 baud rate
3 means RS485 Level and 19200 baud rate

Q. What is the response time of Eagle?
Ans. response time of Eagle is typically 100 mSec. However, the overall response time depends on the level of communication and protocol used.

Q. How Eagle unit is calibrated?
Ans. Eagle unit is factory Calibrated. Special Calibration software and universal Calibrator is used to calibrate Eagle unit. Universal Calibrator is certified and traceable to the Standard Calibration Organization.

Q. What are the different applications where Eagle units can be used?
Ans. Eagle units can be used for:
Process Automation.
Data Acquisition and Data Logging applications
Building Automation
Pharmaceutical machines
Test labs
Turbines

Q. Can I set the Baud Rate of Eagle above 19.2K?
Ans. Yes, you can. RENU Electronics Special Eagle Driver communicates Eagle with Modbus master at fixed baud rate of 57.6K. Its tag definitions explained in Chapter 6 (Modbus Configuration).

Troubleshooting

In this chapter. . .

- Troubleshooting guide for Eagle

9.0 Troubleshooting Guide for Eagle

* Indications of various LED configurations:

READY	PLC COMM	IBM COMM	ERROR	COMMENT
0	0	0	0	POWER OFF
1	0	0	0	POWER ON
blink	X	X	X	Calibration corrupted, default values loaded
1	0	0	1	Driver corrupted
1	blink	0	0	Communication with plc
1	blink	blink	0	Eagle working in Pass Through mode
1	blink	blink	blink	Eagle working in Pass Through mode indicating channel input out of range
1	0	blink	0	Communicating on IBM port
Blink	0	0	blink	Firmware Corrupted

* Note: 0 = LED OFF, 1 = LED ON, X = Don't care